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Conveyance, Treatment, and Control of Municipal Wastewater, Combined Sewer Overflows, and Stormwater Runoff: Summaries of Technical Data

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This report is a part of the 1980 Needs Survey report and is a supplement to the cost estimate report to Congress (PB 81 193625 entitled "1980 Needs Survey - Cost Estimates for Construction of Publicly-Owned Wastewater Treatment Facilities") dated February 10, 1981. It provides detailed summaries of the technical data collected during the Survey for Categories I through VI. A description of the 1980 Survey methodology is presented in Appendix A for Categories I through IV.

The Needs Survey was performed in compliance with the provision of Sections 205(g) and 516(b)(2) of the Clean Water Act of 1977, PL 95-217. The Environmental Protection Agency (EPA) submitted the cost estimates for municipal wastewater, combined sewer overflow, and stormwater runoff, collection, and treatment needs to Congress on February 10, 1981

→ present and future needs for sewage treatment facilities by State. ←

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United States
Environmental Protection
Agency

Office of Water
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Washington, D.C. 20460

EPA

The 1980 Needs Survey

Conveyance, Treatment, and Control of Municipal Wastewater, Combined Sewer Overflows, and Stormwater Runoff

Summaries of Technical Data

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Contents

Chapter I—General Discussions of the 1980 Needs Survey

Introduction
Description of Categories Reported
Facilities Reported
Present and Future Needs
Matrix Measure
Presentation of Data

Chapter II—Summaries of Treatment Facilities Technical Data (Categories I, IIA, IIB)

Table 1—Number of Existing Facilities by Nature of Facility

Table 2—Number of Facilities in the Year 2000 by Nature of Facility

Table 3—Number and Nature of Wastewater Facilities—(Existing and Planned)—United States Totals

Table 4—Number and Flow of State of Treatment Plants by Design Capacity (Existing)

Table 5—Number and Flow by State of Treatment Plants by Design Capacity (Year 2000)

Table 6—Average Domestic Flows by State—Present, Projected, and Percent Change

Table 7—Average Industrial Flows by State—Present, Projected, and Percent Change

Table 8—Projected Industrial Flow to Municipal Treatment Plants by Number, Flow, and Percent of Total Flow

Table 9—Percent of Flows at all Treatment Levels—Existing and Planned—National Summary

Table 10—Plant Loadings, Removal Efficiencies, and Discharge Rates for Facilities Existing in 1980

Table 11—Plant Loadings, Removal Efficiencies and Discharge Rates for Facilities Projected for 2000

Table 12—Treatment Populations—Present and Projected, Resident and Nonresident

Table 13—Septic Tank Population, Present and Projected Resident and Nonresident

Table 14—Populations Served by Treatment With No Discharge—Present and Projected, Resident and Nonresident

Table 15—Populations Served by Raw Discharge—Present and Projected, Resident and Nonresident

Table 16—Populations Served by Facilities Designed for Less Than Secondary Treatment—Present and Projected, Resident and Nonresident

Table 17—Plant Loadings, Removal Efficiencies and Discharge Rates From Facilities Existing in 1980—Facilities Designed for Less Than Secondary Treatment

Table 18—Populations Served by Secondary Treatment—Present and Projected, Resident and Nonresident

Table 19—Plant Loadings, Removal Efficiencies and Discharge Rates From Facilities Existing in 1980—Facilities Designed to Provide Secondary Treatment

Table 20—Plant Loadings, Removal Efficiencies, and Discharge Rates for Facilities Projected for 2000—Facilities Designed to Provide Secondary Treatment

Table 21—Number of Plants Projected for Secondary Treatment by Year 2000—By Total Projected Design Flow

Table 22—Number of New Secondary Treatment Plants to be Built Between 1980 and 2000—By Total Projected Design Flow

Table 23—Dollar Needs For Construction of New Secondary Treatment Facilities by Plant Size

Table 24—Number of Facilities and Reasons for Treatment More Stringent Than Secondary

Table 25—Populations Served by Advanced Secondary Treatment—Present and Projected, Resident and Nonresident

Table 26—Plant Loadings, Removal Efficiencies, and Discharge Rates for Facilities in Operation in 1980—Facilities Designed to Provide Advanced Secondary Treatment

Table 27—Plant Loadings, Removal Efficiencies, and Discharge Rates for Facilities to be in Operation in 2000—Facilities Designed to Provide Advanced Secondary Treatment

Table 28—Number of Plants Projected for Advanced Secondary Treatment by Year 2000—By Total Projected Design Flow

Table 29—Number of New Advanced Secondary Treatment Plants to be Built Between 1980 and 2000—By Total Projected Flow

Table 30—Dollar Needs for Construction of New Advanced Secondary Facilities—By Plant Size

Table 31—Populations Served by Tertiary Treatment—Present and Projected, Resident and Nonresident

Table 32—Plant Loadings, Removal Efficiencies, and Discharge Rates for Facilities in Operation in 1980—Facilities Designed to Provide Tertiary Treatment

Table 33—Plant Loadings, Removal Efficiencies and Discharge Rates for Facilities to be in Operation in 2000—Facilities Designed to Provide Tertiary Treatment

Table 34—Number of Plants Projected for Tertiary Treatment by Year 2000—By Total Projected Design Flow

Table 35—Tertiary Treatment Facilities to be Built Between 1980 and 2000—By Total Projected Design Flow

Table 36—Dollar Needs for Construction of New Tertiary Treatment Facilities—By Plant Size

Table 37—National Dollar Needs for Changes in Existing Treatment Plants

Table 38—National Summary of Treatment Plant Upgrades for Plants Operating in 1980

Table 39—Analysis of Liquid Effluent Disposal

Table 40—Summary of Treatment and Sludge Handling Processes—Numbers of Plants and Associated Flow—United States Totals

Table 41—Projected Change in Treatment Process Use—Numbers of Plants and Associated Flow

Chapter III—Summaries of Conveyance Systems Technical Data (Categories IIIA, IIIB, IVA, IVB)

Table 42—Collection Populations—Present and Projected, Resident and Nonresident

Table 43—Total Pipe Length Needed by Diameter

Table 44—Length and Cost of Pipe Needed by the Year 2000

Table 45—Dollar Needs for all Pipe Size Categories by Diameter

Table 46—Number, Capacity, and Cost of New Pump Stations

Table 47—Number of Facilities Needing Collector Sewers by Service Area Population and Per Capita Sewer Cost

Table 48—Percent of Dollar Needs for Collector Sewers by Service Area Population and Per Capita

Table 49—Total Estimated I/I Flow to Treatment Plants—I/I That is Cost Effective to Remove

Table 50—Required I/I Correction Actions—Facilities Where Correction is Cost Effective

Table 51—Dollar Needs for I/I Correction—Facilities Where Correction is Cost Effective

Table 52—Facilities Requiring Major Rehabilitation—By Basis of Estimate

Table 53—Dollar Needs for Major Rehabilitation—By Basis of Estimate

Chapter IV—Summaries for Combined Sewer Overflow and Stormwater Runoff Technical Data (Categories V and VI)

Table 54—Summary of Existing Combined Sewer Systems

Table 55—Receiving Water Types for Combined Sewer Overflow

Table 56—Summary of Present and Projected Urbanized Area Characteristics

Table 57—Receiving Water Types for Urban Stormwater Runoff Present Conditions (1970)

Table 58—Receiving Water Types for Urban Stormwater Runoff—Year 2000 Conditions

Table 59—Selected Facilities for CSO Control in Urbanized Areas

Table 60—Selected Facilities for Urban Stormwater Pollution Control in Urbanized Areas

Appendix A—Conduct of the Survey Categories I-IV (Treatment Plants and Sewers)

Appendix B—Conduct of the Survey Categories V and VI (Combined Sewer Overflow (CSO) and Urban Stormwater Runoff (SWR))

Appendix C—Description of the 1980 Survey Form

Figure C-1—Form EPA-1 (4-13-79)
Figure C-2—Code Reference Chart

Appendix D—Description of the Combined Sewer System Worksheet

Figure D-1—CSO Worksheet

Chapter I

General Discussions of the 1980 Needs Survey

3<

Introduction

This report is a part of the 1980 Needs Survey report and is a supplement to the cost estimate report to Congress (FRD-19), dated February 10, 1981. It provides detailed summaries of the technical data collected during the Survey for Categories I through VI. A description of the 1980 Survey methodology is presented in Appendix A for Categories I through IV and Appendix B for Categories V and VI.

The Needs Survey was performed in compliance with the provision of Sections 205(a) and 516(b)(2) of the Clean Water Act of 1977, PL 95-217. The Environmental Protection Agency (EPA) submitted the cost estimates for municipal wastewater, combined sewer overflow, and stormwater runoff, collection, and treatment needs to Congress on February 10, 1981.

The 1980 Needs Survey is the fifth such Survey performed by the Agency. After the first two Surveys had been completed, a need became apparent for the tabulation of the great amount of technical data accumulated. The 1976 and 1978 Surveys responded to this need by publishing reports similar to this one which summarized the technical data acquired during the Surveys.

Costs of facilities have historically held the primary focus for these Surveys because they have been used by Congress to provide relative allocations of Construction Grant funds among the States. Besides the cost data, large amounts of technical data are accumulated during each Survey. These technical data are used in many of the cost breakdowns, but have been found to be very useful to many levels of government and quasi-government officials and to industrial organizations. EPA receives a large number of requests annually from these sources for data summaries. One of the purposes of this report is to reduce the number of such requests for special summaries by publishing the commonly asked for information. In addition, the transfer of this material to the total user community working in the field of municipal wastewater treatment and collection, planning, and engineering is considered important to the management and operation of the EPA Grants program. EPA foresees these data can be useful in the facilities planning process, both by the Federal government and the State and local governments.

Only data reported to, or accumulated during, the Survey are summarized herein. The data collection process is described in Appendix A for Categories I through IV and Appendix B for Categories V and VI.

EPA feels the completeness and accuracy of this data base is the best and most up-to-date ever available. In an attempt to make it better or more useful to the user community, comments, discussion, or suggestions or improvements are welcomed.

Description of Categories Reported

The 1980 Needs Survey was conducted on a facility-by-facility basis for Categories I through IV and on an area-by-area basis for Categories V and VI, Appendix C presents a copy of the EPA-1 form (Figures C-1 and C-2) which was used to collect information for Categories I through IV for the 32,000 existing and planned facilities in the country. Appendix D presents a copy of the combined sewer overflow worksheet (Figure D-1) which was used to collect information for Category V for the 1,100 combined sewer areas in the country. Appendices C and D also present an explanation of all items and codes associated with both forms.

Cost estimates for Categories I through IV are presented in "1980 Needs Survey—Cost Estimates for Construction of Publicly-Owned Wastewater Treatment Facilities," (FRD-19).

The 1980 Survey used the same cost estimate categories as were used in 1978, with the exceptions of Categories I and II. The definitions of the treatment categories (I and II) were changed from 1978 to 1980 to more accurately reflect the incremental cost of advanced secondary and advanced wastewater treatment projects, relative to secondary costs. This change affected the split of these costs only, and did not result in the reported of more or less needs.

The categories reported in the 1980 Survey are defined, as follows:

Category I—Secondary Treatment

This included costs for facilities to achieve secondary levels of treatment, regardless of the treatment levels required at the facility site. Incremental costs for treatment levels above secondary were reported in Categories IIA and IIB. Costs for systems designed to serve individual residences are reported in Category I. For purposes of the Survey, "best practicable wastewater treatment technology (BPWTT)" and secondary treatment were considered synonymous.

Category IIA—Advanced Secondary Treatment (AST)

Reported are incremental costs above secondary treatment levels to achieve advanced secondary levels of treatment for those facilities that must achieve such levels. This requirement generally exists where water quality standards require removal of standard pollutants at higher levels than 85 percent or 30/30; but less than 95 percent removal, or 10/10.

Reported are incremental costs above secondary treatment levels to achieve advanced secondary levels of treatment for those facilities that must achieve such levels. This requirement generally exists where water quality standards require removal of standard pollutants at higher levels than 85 percent or 30/30; but less than 95 percent removal, or 10/10. Standard pollutants are defined as five day biochemical oxygen demand (BOD) and suspended solids (Solids).

Category IIB—Advanced Wastewater Treatment (AWT)

Incremental costs above AST are reported for those facilities which require advanced levels of treatmen. This requirement generally exists where water quality standards require removal of such pollutants as phosphorus, ammonia, nitrates, or organic and other substances. In addition, this requirement exists where removal for conventional pollutants (BOD, Solids) exceeds 95 percent, or 10/10. The terms advanced wastewater treatment, AWT, and tertiary treatment are considered synonymous and are used interchangeably throughout this report.

Category IIIA—Correction of Infiltration/Inflow

Included in this category are costs for correction of sewer system infiltration/inflow (I/I) problems. Costs could also be reported for a preliminary sewer system analysis and for a detailed Sewer System Evaluation Survey (SSES).

Category IIIB—Major Rehabilitation of Sewers

Requirements for replacement and/or major rehabilitation of existing sewer systems were reported in this category. Costs were reported if the corrective actions were necessary to insure the total integrity

4<

of the system. Major rehabilitation is considered to be extensive repair of existing sewers beyond the scope of normal maintenance programs, where sewers are collapsing or structurally unsound.

Category IVA—New Collector Sewers
This category included costs of construction of new collector sewer systems and appurtenances designed to correct violations caused by raw discharges, seepage to waters from septic tanks and the like, and/or to comply with Federal, State or local actions.

Category IVB—New Interceptor Sewers
Included in this category were new interceptor sewers and transmission pumping stations necessary for the bulk transport of wastewaters. Outfall sewers were also include in this category.

Category V—Control of Combined Sewer Overflow (CSO)
This category includes projects designed to prevent and/or control periodic bypassing of untreated wastes from combined sewer systems. Combined sewers are designed to convey both sewage and stormwater.

Category VI—Treatment and/or Control of Stormwaters
This category includes projects designed to abate pollution in urbanized areas from stormwater runoff channeled through sewers and other conveyances used only for such runoff. Stormwater channeled through combined sewers which also carry sewage are not included in Category VI.

Facilities Reported

The 1980 Needs Survey contains the most complete inventory of all known and identified publicly owned wastewater treatment facilities. The 1980 Survey continued towards the 100 percent inventory goal set during the 1978 Survey. While the 1978 Survey came very close to achieving the 100 percent inventory, several facilities, mostly small facilities, were identified for the first time during 1980 Survey.

Present and Future Needs

Two time periods pervade Needs Survey reporting. These are the present, meaning January 1, 1980, and the future, which means the year 2000. When dollars are used in this report, they represent January 1980 dollars. This is true for both present and future needs. Present populations used are July 1, 1979.

Metric Measure

All units shown in the technical summaries are in metric units. Where space permits, English units are shown in parentheses. The following are the most common metric units used in this report, along with the factors used to convert to English units.

Multiply	By	To Obtain
Centimeters	0.3937	Inches
Hectares	2.7410	Acres
Kilometers	3,281	Feet
Liters/Capita/Day	0.2642	Gallon/Capita/Day
Meters	3.281	Feet
Metric Tons	0.9072	Short Tons
Thousands of Cubic Meters per Day	0.2642	Millions of Gallons per Day

Presentation of Data

The reporter's format has been structured in such a way that a discussion of each table is presented immediately adjacent to the table. The reader is also referred to Appendices C and D where explanations are given for all items on the data collection forms.

The tables are arranged in the following general sequence:

Chapter II—Categories I, IIA, IIB
- All Levels of Treatments
- Raw Discharge
- Less Than Secondary
- Secondary
- Advanced Secondary
- Tertiary

Chapter III-Categories IIIA, IIIB, IVA, IVB
- Lengths of New Pipe Needed
- New Pump Stations Needed
- Improvements to Existing Sewers

Chapter IV—Categories V and VI
- Combined Sewer Overflow Control
- Stormwater Runoff Control

Please refer to the Table of Contents for a listing of all tables.

Chapter II

Summaries of Treatment Facilities Technical Data (Categories I, IIA, IIB)

Technical data on the municipal sewage treatment facilities in the nation were compiled in the course of the 1980 Needs Survey. The data were collected using the EPA-1 form which is decribed in detail in Appendix C.

The technical data for each treatment facility were collected at the same time the dollar need data were collected. The data were obtained from several sources, including the 1978 Needs Survey data, NPDES permit files, EPA Construction Grant files, and various engineering plans and reports. A further description of the sources and methods used in collecting data for the 1980 Needs Survey is presented in Appendix A.

The technical data collected for all treatment facilities have been compiled and are presented in the 41 tables which follow. These technical tables are structured such that a discussion of each table is presented immediately before the table.

Table 1

Number of Existing Facilities by Nature of Facility

Table 1 is a summary, by State, of the facilities in operation in 1980. Excluded are facilities proposed to be built between 1980 and 2000 and new facilities under construction in 1980.

The nature of a facility is recorded using a numerical code. The various codes are defined as follows:

Code 1: A complete wastewater treatment system consisting of a treatment plant, associated collector and/or interceptor sewers, and methods for disposal of effluent and sludge. All components are under the control of a single treatment authority. The collection system associated with a Code 1 facility is composed of Combined Sewers.

Code 2: A complete wastewater treatment system having all the components listed under Code 1. The collection system associated with a Code 2 facility is composed of Separate Sanitary Sewers.

Code 3: A separate treatment plant. The collection systems which discharge to a Code 3 facility are under the control of one or more other authorities.

Code 4: A municipal wastewater collection system composed of Separate Sanitary Sewers. This system would consist of collector sewers and/or interceptor sewers, force mains, and pumping stations, which either discharge without treatment or discharge to a facility controlled by a different authority. Code 4 systems handle only sanitary wastewaters.

Code 5: A municipal wastewater collection system composed of Combined Sewers. This system would consist of collector sewers adn/or interceptor sewers, force mains, and pumping stations, which either discharge without treatment or discharge to a facility controlled by a different authority. Code 5 systems handle sanitary wastewaters and stormwaters.

Code 6: Other types of systems; for example, operator training facilities.

Code 7: A system for the bulk transmission of wastewater with or without pumping stations, and with or without interceptor sewers.

Code 8: A facility which provides handling, treatment, and disposal of sludge generated by other facilities. Included are vehicles and vehicle fleets used to transport sludge.

Code 9: This refers to communities where the primary method of wastewater disposal is by means of individual onsite systems, usually septic tank systems.

Facilities in operation in 1980, but planned to be abandone dprior to 2000, are included in this summary.

As used in this report, combined sewers are defined as sewers which carry both storm and sanitary wastewaters. Separate sewers carry only sanitary wastes. Storm sewers convey only storm runoff.

STATE	TOTAL	(CODE 1)	(CODE 2)	(CODE 3)	(CODE 4)	(CODE 5)	(CODE 6)	(CODE 7)	(CODE 8)	(CODE 9)
ALABAMA	519	0	233	12	38	0	2	0	0	234
ALASKA	238	2	44	0	14	0	145	0	0	33
ARIZONA	391	0	111	3	16	0	0	0	0	261
ARKANSAS	768	0	287	1	23	0	2	0	0	455
CALIFORNIA	1,636	3	566	20	187	0	23	6	1	830
COLORADO	369	5	271	2	50	0	4	0	0	37
CONNECTICUT	201	13	86	1	21	1	1	0	0	78
DELAWARE	46	4	18	0	11	1	1	0	1	10
DIST. OF COLUM.	1	1	0	0	0	0	0	0	0	0
FLORIDA	495	1	231	3	66	0	4	0	0	190
GEORGIA	793	8	376	6	94	0	3	0	0	306
HAWAII	51	0	33	0	1	0	0	0	0	17
IDAHO	238	13	125	1	10	1	0	0	0	88
ILLINOIS	1,454	90	609	32	261	13	11	0	0	438
INDIANA	705	117	231	2	32	10	5	0	0	308
IOWA	1,005	19	647	0	25	0	1	0	0	313
KANSAS	695	3	550	0	5	0	0	0	0	137
KENTUCKY	473	16	209	1	45	1	3	0	0	198
LOUISIANA	545	0	315	0	24	0	0	1	1	204
MAINE	268	32	51	7	44	28	5	0	0	101
MARYLAND	449	9	128	9	30	2	5	0	0	266
MASSACHUSETTS	263	21	79	8	73	12	4	0	0	66
MICHIGAN	1,068	63	285	11	226	16	6	10	0	451
MINNESOTA	898	13	469	18	136	3	4	0	0	255
MISSISSIPPI	660	0	324	1	12	0	1	0	0	322
MISSOURI	1,011	13	538	0	33	0	1	0	0	426
MONTANA	184	16	136	0	2	0	0	0	0	30
NEBRASKA	547	3	437	0	6	0	0	0	0	101
NEVADA	89	0	46	2	5	0	0	0	0	36
NEW HAMPSHIRE	185	14	43	2	24	8	3	0	0	91
NEW JERSEY	661	14	198	20	230	13	10	0	0	176
NEW MEXICO	211	0	102	0	7	0	1	0	0	101
NEW YORK	2,061	50	369	37	312	20	24	3	0	1,246
NORTH CAROLINA	860	1	497	13	71	0	5	0	0	273
NORTH DAKOTA	374	8	266	0	0	0	0	0	0	100
OHIO	1,207	105	601	4	129	9	3	0	0	356
OKLAHOMA	772	0	493	3	12	0	1	0	0	263
OREGON	300	10	196	3	28	1	3	0	0	59
PENNSYLVANIA	2,295	68	516	36	446	31	3	5	0	1,190
RHODE ISLAND	40	1	16	1	10	1	0	0	0	11
SOUTH CAROLINA	450	0	238	8	68	0	3	0	0	133
SOUTH DAKOTA	342	10	244	0	1	0	0	0	0	87
TENNESSEE	369	3	232	1	21	0	2	0	0	110
TEXAS	2,514	1	1,276	41	258	0	1	1	2	934
UTAH	280	1	80	1	47	0	0	0	0	151
VERMONT	118	24	50	0	4	7	0	0	0	33
VIRGINIA	769	9	237	12	56	3	8	2	0	442
WASHINGTON	450	30	195	5	65	0	3	0	0	152
WEST VIRGINIA	647	41	83	0	41	7	2	0	0	473
WISCONSIN	974	10	517	14	115	2	5	0	0	311
WYOMING	139	1	106	0	6	0	1	0	0	25
AMERICAN SAMOA	6	0	2	0	0	0	0	0	0	4
GUAM	7	0	7	0	0	0	0	0	0	0
N. MARIANAS	5	0	2	0	0	0	0	0	0	3
PUERTO RICO	34	1	31	0	1	0	0	0	0	1
PAC. TR. TERR.	34	0	6	0	0	0	0	0	0	28
VIRGIN ISLANDS	4	0	3	0	1	0	0	0	0	0
U.S. TOTALS	32,168	867	14,083	381	3,441	190	309	28	5	12,944

Table 2

Number of Facilities in the Year 2000 by Nature of Facility

Table 2 lists the total number of facilities, by State, required to satisfy discharge requirements in the year 2000. Included are facilities that are optional in 1980 and will remain in operation through the year 2000, those facilities under construction in 1980, and those facilities proposed to be built before 2000. Excluded are facilities that are operational in 1980 but are projected to be abandoned prior to the year 2000.

The nature of a facility is recorded using a numberical code. The various codes are defined as follows:

Code 1: A complete wastewater treatment system consisting of a treatment plant, associated collector and/or interceptor sewers, and methods for disposal of effluent and sludge. All components are under the control of a single treatment authority. The collection system associated with a Code 1 facility is composed of Combined Sewers.

Code 2: A complete wastewater treatment system having all the components listed under Code 1. The collection system associated with a Code 2 facility is composed of Separate Sanitary Sewers.

Code 3: A separate tretment plant. The collection systems which discharge to a Code 3 facility are under the control of one or more other authorities.

Code 4: A municipal wastewater collection system composed of Separate Sanitary Sewers. This system would consist of collector sewers and/or interceptor sewers, force mains and pumping stations, which either discharge without treatment or discharge to a facility controlled by a different authority. Code 4 systems handle only sanitary wastewaters.

Code 5: A municipal wastewater collection system composed of Combined Sewers. This system would consist of collector sewers and/or interceptor sewers, force mains, and pumping stations, which either discharge without treatment or discharge to a facility controlled by a different authority. Code 5 systems handle sanitary wastewaters and stormwaters.

Code 6: Other types of systems: for example training facilities.

Code 7: A system for the bulk transmission of wastewater with or without pumping stations, and with or without interceptor sewers.

Code 8: A facility which provides handling, treatment, and disposal of sludge generated by other facilities. Included are vehicles and vehicle fleets used to transport sludge.

Code 9: This refers to communities where the primary method of wastewater disposal is by means of individual onsite systems, usually septic tank systems.

As used in this report, combined sewers are defined as sewers which carry both storm and sanitary wastewaters. Separate sewers carry only sanitary wastes. Storm sewers convey only storm runoff.

STATE	TOTAL	(CODE 1)	(CODE 2)	(CODE 3)	(CODE 4)	(CODE 5)	(CODE 6)	(CODE 7)	(CODE 8)	(CODE 9)
ALABAMA	525	0	326	15	93	0	0	0	0	91
ALASKA	238	2	123	0	0	0	110	0	0	3
ARIZONA	390	0	147	5	27	0	1	0	0	210
ARKANSAS	764	0	621	2	47	0	1	0	0	93
CALIFORNIA	1,652	3	922	21	274	0	38	10	1	383
COLORADO	369	4	290	3	61	0	3	0	0	8
CONNECTICUT	197	12	75	2	48	1	1	0	0	58
DELAWARE	45	4	19	0	19	1	1	0	1	0
DIST. OF COLUM.	1	1	0	0	0	0	0	0	0	0
FLORIDA	496	1	318	7	159	0	3	0	0	8
GEORGIA	795	8	415	13	174	0	0	0	0	185
HAWAII	52	0	40	0	11	0	0	0	0	1
IDAHO	238	14	185	0	21	0	0	0	0	18
ILLINOIS	1,424	86	725	35	329	18	1	0	0	230
INDIANA	703	114	468	4	95	14	1	0	0	7
IOWA	985	18	828	0	46	0	1	0	0	92
KANSAS	682	3	604	0	21	0	0	0	0	54
KENTUCKY	474	15	382	2	72	2	0	0	0	1
LOUISIANA	521	0	445	2	65	0	0	1	1	7
MAINE	265	49	147	8	39	11	0	4	0	7
MARYLAND	442	9	332	6	83	2	2	0	0	8
MASSACHUSETTS	263	25	103	9	114	8	0	0	1	3
MICHIGAN	1,066	62	439	12	382	17	1	11	0	142
MINNESOTA	894	14	556	15	168	2	0	0	0	139
MISSISSIPPI	665	0	515	5	111	0	0	0	0	34
MISSOURI	930	12	682	2	97	0	1	0	0	136
MONTANA	184	16	160	0	4	0	0	0	0	4
NEBRASKA	546	3	461	0	7	0	0	0	0	75
NEVADA	89	0	71	2	11	0	1	0	0	4
NEW HAMPSHIRE	183	19	123	1	35	2	2	0	0	1
NEW JERSEY	657	9	127	26	424	18	0	0	1	52
NEW MEXICO	210	0	172	0	11	0	0	0	0	27
NEW YORK	2,050	52	727	49	672	19	3	5	1	522
NORTH CAROLINA	865	1	633	22	196	0	0	0	0	13
NORTH DAKOTA	373	8	304	0	0	0	0	0	0	61
OHIO	1,192	107	683	5	321	9	0	0	0	67
OKLAHOMA	759	0	661	3	36	0	0	0	0	59
OREGON	299	9	223	4	52	2	0	0	0	9
PENNSYLVANIA	2,291	76	1,149	37	830	22	2	5	0	170
RHODE ISLAND	40	1	24	1	13	1	0	0	0	0
SOUTH CAROLINA	455	0	267	15	161	0	0	0	0	12
SOUTH DAKOTA	342	10	277	0	0	0	0	0	0	55
TENNESSEE	371	3	283	5	79	0	0	0	0	1
TEXAS	2,528	1	2,137	38	343	0	1	4	3	1
UTAH	280	1	196	1	73	0	0	0	0	9
VERMONT	118	30	73	0	11	1	0	0	0	3
VIRGINIA	737	7	283	16	177	4	2	2	0	246
WASHINGTON	450	29	306	5	94	2	3	0	0	11
WEST VIRGINIA	646	46	487	1	103	2	1	0	0	6
WISCONSIN	972	10	606	15	228	2	3	0	0	108
WYOMING	135	1	118	0	12	0	0	0	0	4
AMERICAN SAMOA	5	0	5	0	0	0	0	0	0	0
GUAM	6	0	6	0	0	0	0	0	0	0
N. MARIANAS	4	0	3	0	0	0	0	0	0	1
PUERTO RICO	34	1	30	0	3	0	0	0	0	0
PAC. TR. TERR.	34	0	23	0	0	0	0	0	0	11
VIRGIN ISLANDS	4	0	4	0	0	0	0	0	0	0
U.S. TOTALS	31,935	896	20,329	414	6,452	168	183	42	9	3,450

Table 3

Number and Nature of Wastewater Facilities (Existing and Planned) United States Totals

Table 3 is a two part table. The upper table is condensation of Tables 1 and 2 into a national summary. A facility is included in the existing category if it was operational in 1980. A facility listed as To Be Abandoned was operational in 1980 and is expected to be phased out be 2000. A facility listed as Under Construction was in the process of being built in 1980. A facility in the To Be Built category was not in operation or under construction in 1980 but is projected to be operational by 2000. The Projected 2000 row lists the total numbers of facilities expected to be in operatoin in the year 2000.

The lower table summarizes the nature of projected changes to existing wastewater treatment plants. Only treatment plants in operation in 1980 are included. A brief explanation of the projected change categories follows:

Enlarge: The hydraulic capacity of a plant will be increased while the degree of treatment the plant is capable of achieving will remain the same.

Upgrade: The degree of treatment that a plant is capable of achieving will be improved but the hydraulic capacity will remain the same.

Enlarge and Upgrade: This means a plant's hydraulic capacity will be increased and the degree of treatment the plant is capable of achieving will be improved.

Replace: This describes the situation when an existing plant is demolished and a completely new plant is constructed on the same site.

Abandon: This change is indicated when an authority relinquishes its responsibility for the collection and treatment of wastewater. Usually the treatment plant is taken out of operation and the sewage is diverted to another facility for treatment. The responsibility for operating the collection system (if one is involved) is passed to a new authority.

No Change: This category is for plants that will remain essentially unchanged through the year 2000.

Other: A number of situations are covered by this category. One common situation is a treatment plant which will require a capital expenditure, such as for a new sludge digestor, but the degree of treatment and hydraulic capacity will not be changed.

Abandon, Retain Sewers: This change is indicated when an authority that operates a treatment plant and a collection system takes the treatment plant out of operation and continues to operate the collection system. The sewage is diverted to a treatment plant operated by a different authority This situation usually occurs when a regional treatment plant is constructed to serve several communities.

NUMBER OF FACILITIES

	NUMBER OF FACILITIES	TREATMENT PLANTS	SEWER SYSTEMS	OTHER	TRUNK SEWERS	SLUDGE HANDLING FACILITIES	SEPTIC SYSTEMS
EXISTING:	32,168	15,251	18,541	309	28	5	12,944
TO BE ABANDONED:	11,323	1,667	387	156	0	0	9,496
UNDER CONSTRUCTION:	385	229	307	1	2	0	0
TO BE BUILT:	9,736	7,808	9,498	112	14	3	0
PROJECTED 2000:	31,935	21,639	27,837	183	42	9	3,450

NATURE OF PROJECTED CHANGE
(EXISTING PLANTS)

ENLARGE	UPGRADE	ENLARGE AND UPGRADE	REPLACE	ABANDON	NO CHANGE	OTHER	ABANDON, RETAIN SEWERS
1,710	2,587	2,401	1,403	421	5,272	211	1,246

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Table 4

Number and Flow by State of Treatment Plants by Design Capacity (Existing)

Table 4 is a flow summary of all treatments plants in operation in 1980. Excluded are treatment plants projected to be built and treatment plants under construction in 1980. A summary is provided for each State and U.S. Territory. National totals are summarized at the bottom of the table.

In the first column the total number of existing treatment plants in each State is reported along with the total wastewater treatment capacity represented by the plants. The Present Design Flow for each plant was used to calculate the total treatment capacity value. The present design flow may be equal to, greater, or less than the Exsting Flow for any particular plant.

Subsequent columns provide a breakdown of the State totals into five flow ranges. The ranges are specified in the column headngs and are reported in thousands of cubic meters per day and, in parentheses under the headings, in millions of gallons per day. Reported for each flow range are the number of plants in the range and their total treatment capacity (M^3/day x 1,000). Also reported is the percentage of total State treatment capacity that is accounted for by each flow range.

These data are for all types of treatment plants regardless of level of treatment. Numerous other tables follow which provide summaries by level of treatment for both existing plants and projected plants.

The data indicate nearly 80 percent of the treatment plants in operation in 1980 have a design capacity less than or equal to 1.05 mgd (4×10^6 M^3/day). These small plants account for 8.4 percent of the total U.S. wastewater treatment capacity. The data also indicate 0.6 percent of the treatment plants in operation in 1980 have a design capacity greater than or equal to 50.2 mgd (1.9×10^8 M^3/day). These large plants account for almost 39 percent of the total U.S. wastewater treatment capacity.

CUBIC METERS PER DAY X 1000: (MILLION GALLONS PER DAY):			0-.40 (0-.105)			.401-4.0 (.106-1.05)			4.001-40 (1.06-10.5)			40.001-190 (10.57-50.2)			190+ (50.2+)		
STATE	TOTAL # OF PLANTS	TOTAL FLOW	# OF PLANTS	TOTAL FLOW	% OF STATE FLOW	# OF PLANTS	TOTAL FLOW	% OF STATE FLOW	# OF PLANTS	TOTAL FLOW	% OF STATE FLOW	# OF PLANTS	TOTAL FLOW	% OF STATE FLOW	# OF PLANTS	TOTAL FLOW	% OF STATE FLOW
ALABAMA	245	1,726	28	7	0.4	148	234	13.5	62	796	46.1	7	687	39.7	0	0	0.0
ALASKA	46	220	25	3	1.6	14	19	8.6	6	68	31.2	1	128	58.4	0	0	0.0
ARIZONA	114	1,043	38	6	0.6	54	86	8.2	17	189	18.1	4	420	40.2	1	340	32.6
ARKANSAS	288	1,015	78	20	2.0	160	213	21.0	46	527	51.9	4	253	24.9	0	0	0.0
CALIFORNIA	589	11,909	129	25	0.2	242	376	3.1	170	2,421	20.3	38	3,018	25.3	10	6,068	50.9
COLORADO	278	1,619	119	25	1.5	115	176	10.9	38	406	25.0	5	367	22.6	1	643	39.7
CONNECTICUT	100	2,067	6	1	0.0	32	69	3.3	49	837	40.5	12	931	45.0	1	227	10.9
DELAWARE	22	425	6	0	0.1	12	23	5.5	3	60	14.1	0	0	0.0	1	340	80.0
DIST. OF COLUM.	1	1,169	0	0	0.0	0	0	0.0	0	0	0.0	0	0	0.0	1	1,169	99.9
FLORIDA	235	4,053	15	3	0.0	95	188	4.6	108	1,585	39.1	14	1,385	34.1	3	889	21.9
GEORGIA	390	3,140	88	18	0.6	214	337	10.7	70	883	28.1	17	1,446	46.0	1	454	14.4
HAWAII	33	547	5	1	0.2	11	20	3.7	16	215	39.3	0	0	0.0	1	310	56.6
IDAHO	139	541	60	12	2.3	57	80	14.8	18	224	41.5	4	223	41.2	0	0	0.0
ILLINOIS	731	9,655	175	45	0.4	398	528	5.4	130	1,556	16.1	23	1,649	17.0	5	5,875	60.8
INDIANA	350	3,853	54	16	0.4	216	292	7.5	59	737	19.1	17	1,425	36.9	4	1,381	35.8
IOWA	668	1,447	368	74	5.1	250	258	17.8	42	490	33.8	8	624	43.1	0	0	0.0
KANSAS	553	1,228	313	61	5.0	201	241	19.6	34	450	36.6	5	475	38.6	0	0	0.0
KENTUCKY	226	1,307	38	8	0.6	143	178	13.6	40	449	34.3	4	272	20.8	1	397	30.4
LOUISIANA	315	1,914	64	12	0.6	175	273	14.2	68	720	37.6	7	446	23.3	1	461	24.1
MAINE	90	525	12	2	0.4	43	65	12.4	32	298	56.7	3	159	30.3	0	0	0.0
MARYLAND	146	2,007	44	8	0.4	66	93	4.6	28	422	21.0	6	422	21.0	2	1,059	52.8
MASSACHUSETTS	108	3,942	6	1	0.0	36	74	1.8	51	628	15.9	10	864	21.9	5	2,373	60.2
MICHIGAN	359	6,782	61	17	0.2	200	293	4.3	76	769	11.3	18	1,760	25.9	4	3,940	58.1
MINNESOTA	500	2,052	231	48	2.3	225	264	12.8	37	428	20.8	6	485	23.6	1	825	40.2
MISSISSIPPI	325	1,139	99	24	2.1	183	242	21.2	40	476	41.8	3	395	34.7	0	0	0.0
MISSOURI	551	3,430	243	49	1.4	247	354	10.3	53	590	17.2	5	505	14.7	3	1,930	56.2
MONTANA	152	399	77	12	3.2	62	72	18.0	11	155	38.8	2	158	39.7	0	0	0.0
NEBRASKA	440	987	307	43	4.4	111	122	12.3	19	242	24.5	2	302	30.6	1	276	27.9
NEVADA	48	709	15	2	0.3	20	29	4.2	9	75	10.6	3	348	49.0	1	253	35.7
NEW HAMPSHIRE	59	509	7	1	0.2	32	52	10.3	18	184	36.2	1	73	14.4	1	196	38.6
NEW JERSEY	232	4,793	15	3	0.0	98	198	4.1	99	1,308	27.3	17	1,775	37.0	3	1,506	31.4
NEW MEXICO	102	524	39	7	1.3	41	67	12.8	20	218	41.7	2	230	44.0	0	0	0.0
NEW YORK	456	11,473	62	13	0.1	225	359	3.1	134	1,761	15.3	21	2,120	18.4	14	7,218	62.9
NORTH CAROLINA	511	2,570	237	21	0.8	168	266	10.3	94	1,378	53.6	12	903	35.1	0	0	0.0
NORTH DAKOTA	274	156	225	27	17.4	41	36	23.6	8	92	58.9	0	0	0.0	0	0	0.0
OHIO	710	7,104	198	38	0.5	348	497	6.9	136	1,748	24.6	19	1,447	20.3	9	3,372	47.4
OKLAHOMA	496	1,308	244	46	3.5	201	254	19.4	46	589	45.0	5	418	31.9	0	0	0.0
OREGON	209	1,646	41	9	0.5	120	182	11.0	40	494	30.0	7	581	35.3	1	378	22.9
PENNSYLVANIA	620	6,531	110	20	0.3	313	507	7.7	180	2,212	33.8	12	1,069	16.3	5	2,721	41.6
RHODE ISLAND	18	640	0	0	0.0	5	5	0.8	9	171	26.7	3	221	34.5	1	242	37.8
SOUTH CAROLINA	246	1,400	42	10	0.7	137	204	14.6	61	747	53.3	6	438	31.2	0	0	0.0
SOUTH DAKOTA	254	268	173	28	10.7	70	73	27.4	11	165	61.7	0	0	0.0	0	0	0.0
TENNESSEE	236	2,559	31	6	0.2	135	209	8.1	63	732	28.6	4	452	17.6	3	1,158	45.2
TEXAS	1,318	7,186	429	85	1.1	664	993	13.8	196	2,135	29.7	24	1,795	24.9	5	2,176	30.2
UTAH	82	1,024	15	3	0.3	36	50	4.9	24	315	30.8	7	654	63.9	0	0	0.0
VERMONT	74	217	18	3	1.7	39	62	28.5	17	151	69.7	0	0	0.0	0	0	0.0
VIRGINIA	258	2,458	82	16	0.6	122	166	6.7	37	447	18.2	15	1,357	55.2	2	469	19.0
WASHINGTON	230	2,212	43	10	0.4	117	179	8.0	61	804	36.3	8	745	33.6	1	473	21.3
WEST VIRGINIA	124	611	24	5	0.9	74	104	17.0	22	212	34.7	4	288	47.2	0	0	0.0
WISCONSIN	541	3,461	217	48	1.4	252	336	9.7	56	641	18.5	13	1,024	29.6	3	1,410	40.7
WYOMING	107	170	62	9	5.4	33	42	24.9	12	118	69.5	0	0	0.0	0	0	0.0
AMERICAN SAMOA	2	4	0	0	0.0	2	4	99.9	0	0	0.0	0	0	0.0	0	0	0.0
GUAM	7	98	1	0	0.0	4	7	7.5	0	0	0.0	2	90	92.3	0	0	0.0
N. MARIANAS	2	4	0	0	0.0	2	4	99.9	0	0	0.0	0	0	0.0	0	0	0.0
PUERTO RICO	32	412	0	0	0.0	20	31	7.7	7	66	16.0	5	314	76.2	0	0	0.0
PAC. TR. TERR.	6	12	2	0	6.2	4	11	93.7	0	0	0.0	0	0	0.0	0	0	0.0
VIRGIN ISLANDS	3	32	0	0	0.0	0	0	0.0	3	32	99.9	0	0	0.0	0	0	0.0
U.S. TOTALS	15,251	130,260	5,021	979	0.7	7,033	10,124	7.7	2,686	33,444	25.6	415	35,164	26.9	96	50,545	38.8

Table 5

Number Flow by State of Treatment Plants by Design Capacity (Year 2000)

Table 5 is a flow summary of all treatment plants projected to be in operation in the year 2000. Excluded are plants that are operational in 1980 and are projected to be abandoned by 2000.

The Projected Design Flow was used to calculate the total treatment capacity value. All other computations used to prepare this table are directly comparable to the methods used to prepare Table 4.

All flows are reported in thousands of cubic meters per day.

The data indicate nearly 83 percent of the treatment plants projected to be operational in 2000 will have a design capacity less than or equal to 1.05 mgd (4 x 10^6 M^3/day). These small plants will account for 8.2 percent of the total U.S. wastewater treatment capacity. The data also indicate 0.6 percent of the treatment plants projected to be operational in 2000 will have a design capacity greater than or equal to 50.2 mgd (1.9 x 10^8 M^3/day). These large plants will account for almost 40 percent of the total U.S. wastewater treatment capacity.

CUBIC METERS PER DAY X 1000: (MILLION GALLONS PER DAY):			0-,40 (0-,105)			,401-4,0 (,106-1,05)			4,001-40 (1,06-10,5)			40,001-190 (10,57-50,2)			190+ (50,2+)		
STATE	TOTAL # OF PLANTS	TOTAL FLOW	# OF PLANTS	TOTAL FLOW	% OF STATE FLOW	# OF PLANTS	TOTAL FLOW	% OF STATE FLOW	# OF PLANTS	TOTAL FLOW	% OF STATE FLOW	# OF PLANTS	TOTAL FLOW	% OF STATE FLOW	# OF PLANTS	TOTAL FLOW	% OF STATE FLOW
ALABAMA	341	1,998	78	19	0,9	183	262	13,1	69	779	39,0	11	937	46,9	0	0	0,0
ALASKA	125	363	91	8	2,3	18	27	7,6	15	170	46,9	1	156	43,0	0	0	0,0
ARIZONA	152	1,416	33	6	0,4	84	135	9,5	29	320	22,6	5	499	35,2	1	454	32,0
ARKANSAS	623	1,246	377	52	4,2	182	225	18,0	58	592	47,5	6	375	30,1	0	0	0,0
CALIFORNIA	946	12,804	372	70	0,5	349	481	3,7	173	2,613	20,4	39	3,176	24,8	13	6,461	50,4
COLORADO	297	1,951	109	22	1,1	130	194	9,9	51	604	30,9	6	454	23,2	1	676	34,6
CONNECTICUT	89	2,084	2	0	0,0	20	42	2,0	54	909	43,6	12	904	43,4	1	227	10,8
DELAWARE	23	595	6	1	0,2	11	25	4,2	3	34	5,7	2	149	25,0	1	384	64,5
DIST. OF COLUM.	1	1,169	0	0	0,0	0	0	0,0	0	0	0,0	0	0	0,0	1	1,169	99,9
FLORIDA	326	7,038	28	6	0,0	145	231	3,2	115	1,716	24,3	31	2,358	33,5	7	2,725	38,7
GEORGIA	436	3,668	102	24	0,6	228	321	8,7	86	1,134	30,9	18	1,622	44,2	2	565	15,4
HAWAII	40	757	2	0	0,0	16	34	4,4	18	231	30,5	3	180	23,8	1	310	40,9
IDAHO	199	684	97	20	2,9	74	96	14,1	22	246	35,9	6	321	46,9	0	0	0,0
ILLINOIS	846	11,086	277	64	0,5	403	536	4,8	135	1,682	15,1	26	1,931	17,4	5	6,870	61,9
INDIANA	586	4,156	256	47	1,1	232	283	6,8	75	885	21,3	19	1,557	37,4	4	1,381	33,2
IOWA	846	1,697	536	91	5,4	252	283	16,7	49	542	31,9	9	779	45,9	0	0	0,0
KANSAS	607	1,383	365	61	4,4	190	218	15,7	48	638	46,1	3	268	19,4	1	196	14,2
KENTUCKY	399	2,107	169	37	1,7	165	196	9,3	56	614	29,1	7	540	25,6	2	719	34,1
LOUISIANA	407	2,390	162	31	1,3	192	268	11,2	83	912	38,1	8	516	21,6	2	660	27,6
MAINE	204	660	79	16	2,5	85	107	16,2	36	333	50,5	4	202	30,6	0	0	0,0
MARYLAND	347	2,536	200	29	1,1	108	141	5,5	28	473	18,6	8	604	23,8	3	1,287	50,7
MASSACHUSETTS	137	4,794	10	1	0,0	44	86	1,7	65	893	18,6	13	1,155	24,1	5	2,657	55,4
MICHIGAN	513	8,359	119	29	0,3	269	373	4,4	102	1,078	12,9	18	1,940	23,2	5	4,937	59,0
MINNESOTA	585	2,435	328	59	2,4	208	268	11,0	42	499	20,5	6	510	20,9	1	1,097	45,0
MISSISSIPPI	520	1,341	290	48	3,6	182	222	16,5	44	539	40,2	2	127	9,5	2	402	30,0
MISSOURI	696	3,419	378	64	1,8	243	349	10,2	62	652	19,0	10	1,058	30,9	3	1,294	37,8
MONTANA	176	446	90	14	3,3	70	86	19,3	14	186	41,6	2	158	35,5	0	0	0,0
NEBRASKA	464	1,070	317	48	4,5	120	133	12,4	23	265	24,7	3	358	33,4	1	264	24,7
NEVADA	73	873	35	6	0,7	22	26	2,9	12	144	16,5	3	442	50,6	1	253	29,0
NEW HAMPSHIRE	143	804	40	9	1,2	71	98	12,2	28	320	39,8	3	178	22,2	1	196	24,4
NEW JERSEY	162	5,639	4	1	0,0	40	82	1,4	88	1,210	21,4	25	1,884	33,4	5	2,460	43,6
NEW MEXICO	172	686	93	17	2,5	53	78	11,4	25	300	43,7	0	0	0,0	1	289	42,2
NEW YORK	828	13,813	258	54	0,3	375	534	3,8	147	2,070	14,9	30	2,483	17,9	18	8,670	62,7
NORTH CAROLINA	656	3,278	349	40	1,2	189	277	8,4	99	1,543	47,0	19	1,416	43,1	0	0	0,0
NORTH DAKOTA	312	216	250	30	13,9	52	43	20,1	10	142	65,8	0	0	0,0	0	0	0,0
OHIO	795	8,293	279	58	0,7	328	452	5,4	155	2,081	25,0	24	1,779	21,4	9	3,921	47,2
OKLAHOMA	664	1,658	376	64	3,8	225	267	16,1	57	667	40,2	5	432	26,0	1	227	13,6
OREGON	236	1,938	65	14	0,7	120	181	9,3	42	588	30,3	8	774	39,9	1	378	19,5
PENNSYLVANIA	1,262	8,113	437	89	1,1	582	844	10,4	224	2,572	31,7	13	1,063	13,1	6	3,542	43,6
RHODE ISLAND	26	831	4	0	0,1	4	6	0,7	12	170	20,4	5	351	42,2	1	302	36,4
SOUTH CAROLINA	282	1,788	76	14	0,8	123	181	10,1	76	1,032	57,7	7	559	31,2	0	0	0,0
SOUTH DAKOTA	287	316	206	31	9,7	67	67	21,2	12	110	34,9	2	107	34,0	0	0	0,0
TENNESSEE	291	3,329	65	15	0,4	144	210	6,3	71	846	25,4	7	535	16,0	4	1,722	51,7
TEXAS	2,176	9,110	1,110	177	1,9	792	1,157	12,7	237	2,779	30,5	31	2,468	27,1	6	2,526	27,7
UTAH	198	1,088	110	19	1,8	61	75	6,9	21	247	22,7	6	745	68,5	0	0	0,0
VERMONT	103	245	36	7	3,1	51	73	29,8	16	164	67,0	0	0	0,0	0	0	0,0
VIRGINIA	306	3,162	93	18	0,5	149	203	6,4	41	501	15,8	20	1,758	55,5	3	680	21,5
WASHINGTON	340	3,033	104	24	0,7	163	217	7,1	63	914	30,1	8	648	21,3	2	1,230	40,5
WEST VIRGINIA	534	1,065	209	43	4,1	284	381	35,7	37	351	33,0	4	288	27,1	0	0	0,0
WISCONSIN	631	3,738	267	51	1,3	278	381	10,1	69	792	21,1	14	1,103	29,5	3	1,410	37,7
WYOMING	119	285	71	8	2,9	34	44	15,7	13	163	57,4	1	68	23,8	0	0	0,0
AMERICAN SAMOA	5	24	2	0	1,9	2	0	3,9	1	23	94,0	0	0	0,0	0	0	0,0
GUAM	6	87	0	0	0,0	3	4	5,3	2	37	42,5	1	45	52,1	0	0	0,0
N. MARIANAS	3	21	0	0	0,0	1	1	7,1	2	19	92,8	0	0	0,0	0	0	0,0
PUERTO RICO	31	1,344	0	0	0,0	7	19	1,4	14	200	14,9	9	851	63,3	1	272	20,2
PAC. TR. TERR.	23	37	4	0	2,6	17	21	57,0	2	15	40,3	0	0	0,0	0	0	0,0
VIRGIN ISLANDS	4	43	0	0	0,0	1	0	2,0	3	42	97,9	0	0	0,0	0	0	0,0
U.S. TOTALS	21,639	158,540	9,416	1,686	1,0	8,441	11,571	7,2	3,134	39,609	24,9	523	42,838	27,0	125	62,833	39,6

Table 6

Average Domestic Flows by State - Present, Projected, and Percent Change

(Thousands of Cubic Meters per Day)

Table 6 summarizes the present (1980) and projected (2000) quantity of flow treated by publicly owned treatment plants that is from domestic sources. A similar summary dealing with flow from industrial sources is presented in Table 7.

A further explanation of these summaries is presented below:

Actual: All flows reported in this category are compiled from the Actual Average Daily Flow received at treatment works during the most recent 12 month period for which information is available. Flows reported in this category were compiled from records collected between late 1978 and early 1980. The major source of flow information was the self-monitoring reports that are completed by every facility with an NPDES permit.

Present Design: All flows reported in this category are compiled from the average daily flow a treatment plant is designed to handle. The design capacity reported was capacity in place in 1980.

Projected Design: All flows reported in this category are compiled from the average daily flow that a treatment plant will be designed to handle in the year 2000.

Total Flow: The total flow is expressed in thousands of cubic meters per day. Total flow is defined as all wastewaters moving through the treatment plant from all sources; including domestic, commerical, industrial, and infiltration/inflow.

Domestic Flow: The domestic flow is expressed in thousands of cubic meters per day. Domestic flow is defined as all wastewaters moving through the treatment plant from all sources except industrial sources.

Liters/Capita/Day: These values are calculated using the Domestic Flow and the total resident and nonresident population. The actual number of residents and nonresidents receiving treatment in 1980 was used in the Actual and Present Design categories. The number of residents and nonresidents a treatment plant will be capable of serving in the year 2000 was used in the Projected Design category.

Percent Change: This category presnts a comparison between the present situation (2000). The change in each parameter between the Present Design and the Projected Design is expressed as an increase or decrease using the Present Design as the base.

	ACTUAL			PRESENT DESIGN			PROJECTED DESIGN			PERCENT CHANGE		
STATE	TOTAL FLOW	DOM. FLOW	LITERS / CAP./DAY	TOTAL FLOW	DOM. FLOW	LITERS / CAP./DAY	TOTAL FLOW	DOM. FLOW	LITERS / CAP./DAY	TOTAL FLOW	DOM. FLOW	LITERS / CAP./DAY
ALABAMA	1,262	1,032	490	1,726	1,486	705	1,998	1,668	462	+15.7	+12.2	-34.4
ALASKA	135	121	595	220	201	990	363	344	513	+64.9	+70.5	-48.1
ARIZONA	755	728	389	1,043	994	531	1,416	1,392	344	+35.7	+40.0	-35.2
ARKANSAS	631	512	413	1,015	900	726	1,246	1,092	430	+22.7	+21.3	-40.7
CALIFORNIA	8,739	7,233	361	11,909	9,825	490	12,804	10,566	399	+7.5	+7.5	-18.5
COLORADO	1,168	974	371	1,619	1,389	530	1,951	1,712	366	+20.4	+23.2	-30.8
CONNECTICUT	1,358	1,123	588	2,067	1,625	852	2,084	1,686	578	+0.7	+3.7	-32.1
DELAWARE	317	176	324	425	281	517	595	436	354	+40.0	+54.9	-31.4
DIST. OF COLUM.	1,128	1,128	429	1,169	1,169	445	1,169	1,169	371	+0.0	+0.0	-16.5
FLORIDA	2,343	2,137	386	4,053	3,775	682	7,038	6,612	442	+73.6	+75.1	-35.1
GEORGIA	1,933	1,489	469	3,140	2,524	795	3,668	2,885	472	+16.8	+14.3	-40.6
HAWAII	363	325	480	547	513	759	757	703	435	+38.3	+37.0	-42.5
IDAHO	343	281	570	541	457	925	684	599	531	+26.5	+30.9	-42.6
ILLINOIS	7,745	6,235	625	9,655	7,777	780	11,086	8,874	737	+14.8	+14.1	-5.4
INDIANA	2,723	2,152	582	3,853	3,048	824	4,156	3,215	591	+7.8	+5.4	-28.2
IOWA	1,161	963	444	1,447	1,205	556	1,697	1,365	458	+17.2	+13.2	-17.7
KANSAS	844	720	392	1,228	1,035	563	1,383	1,174	459	+12.6	+13.4	-18.4
KENTUCKY	990	755	433	1,307	980	563	2,107	1,563	455	+61.2	+59.3	-19.2
LOUISIANA	1,304	1,263	438	1,914	1,861	645	2,390	2,266	479	+24.8	+21.7	-25.6
MAINE	418	323	570	525	412	725	660	539	502	+25.5	+30.9	-30.7
MARYLAND	1,347	1,136	442	2,007	1,794	698	2,536	2,179	412	+26.3	+21.4	-40.9
MASSACHUSETTS	3,235	2,475	652	3,942	2,969	782	4,798	3,592	600	+21.6	+20.9	-23.2
MICHIGAN	5,332	4,176	607	6,782	6,068	882	8,359	6,558	708	+23.2	+8.0	-19.7
MINNESOTA	1,586	1,121	382	2,052	1,523	519	2,435	1,773	475	+18.6	+16.3	-8.5
MISSISSIPPI	952	834	576	1,139	1,049	725	1,341	1,205	493	+17.7	+14.8	-31.9
MISSOURI	2,199	1,798	417	3,430	2,706	627	3,419	2,640	397	-0.3	-2.4	-36.6
MONTANA	246	239	464	399	390	758	446	432	561	+11.8	+10.6	-26.0
NEBRASKA	658	513	375	987	819	597	1,070	805	428	+8.3	-1.5	-28.3
NEVADA	576	575	827	709	709	1,018	873	854	595	+23.1	+20.5	-41.4
NEW HAMPSHIRE	284	207	494	509	401	956	804	623	542	+57.7	+55.0	-43.2
NEW JERSEY	3,959	3,124	477	4,793	4,310	659	5,639	4,296	428	+17.6	-0.4	-34.9
NEW MEXICO	388	364	346	524	500	476	686	659	395	+30.8	+31.7	-17.0
NEW YORK	9,396	8,508	573	11,473	10,282	692	13,813	12,191	569	+20.4	+18.5	-17.7
NORTH CAROLINA	1,681	1,077	422	2,570	1,832	718	3,278	2,255	458	+27.5	+23.0	-36.1
NORTH DAKOTA	149	136	314	156	145	328	216	196	340	+38.5	+37.5	+3.6
OHIO	5,439	4,398	527	7,104	5,686	682	8,293	6,366	535	+16.7	+11.9	-21.5
OKLAHOMA	927	847	396	1,308	1,214	568	1,658	1,534	431	+26.7	+26.3	-24.1
OREGON	1,052	807	549	1,646	1,340	912	1,938	1,648	541	+17.6	+22.9	-40.7
PENNSYLVANIA	5,368	4,600	496	6,531	5,641	609	8,113	7,037	529	+24.2	+24.7	-13.1
RHODE ISLAND	458	302	474	640	458	719	831	576	540	+29.8	+25.6	-24.8
SOUTH CAROLINA	945	666	449	1,400	1,092	716	1,788	1,287	390	+27.6	+17.8	-45.4
SOUTH DAKOTA	209	180	386	268	238	509	316	279	414	+17.9	+17.2	-18.7
TENNESSEE	1,709	1,226	550	2,559	1,907	856	3,329	2,389	549	+30.0	+25.2	-35.8
TEXAS	5,596	5,080	447	7,186	6,610	582	9,110	8,321	442	+26.7	+25.8	-23.9
UTAH	808	743	629	1,024	912	772	1,088	993	578	+6.2	+8.8	-25.1
VERMONT	168	150	552	217	200	738	245	218	467	+12.9	+8.5	-36.6
VIRGINIA	1,635	1,466	405	2,458	2,029	561	3,162	2,592	415	+28.6	+27.7	-25.9
WASHINGTON	1,604	1,401	500	2,212	1,960	701	3,033	2,656	521	+37.1	+35.4	-25.6
WEST VIRGINIA	387	326	422	611	541	700	1,065	942	453	+74.3	+73.9	-35.3
WISCONSIN	2,406	1,806	508	3,461	2,487	700	3,738	2,672	492	+8.0	+7.4	-29.6
WYOMING	172	171	496	170	169	492	285	275	441	+67.6	+62.4	-10.3
AMERICAN SAMOA	1	1	967	4	4	2,481	24	13	375	+458.4	+212.7	-84.8
GUAM	24	24	326	98	98	1,294	87	87	397	-11.4	-11.4	-69.2
N. MARIANAS	2	2	1,452	4	4	2,660	21	21	629	+330.7	+330.7	-76.3
PUERTO RICO	517	468	266	412	363	206	1,344	1,102	340	+226.3	+203.5	+64.5
PAC. TR. TERR.	1	1	54	12	12	525	37		333	+209.6	+211.0	-36.5
VIRGIN ISLANDS	14	14	214	32	32	463	43	43	394	+35.0	+35.0	-14.9
U.S. TOTALS	97,117	80,679	479	130,260	109,981	654	158,540	131,234	490	+21.7	+19.3	-25.0

NOTES: 1. FLOWS IN CUBIC METERS X 1000 2. SUM OF ENTRIES MAY NOT EQUAL TOTALS DUE TO ROUND-OFFS

Table 7

Average Industrial Flows by State - Present, Projected, and Percent Change

(Thousands of Cubic Meters per Day)

Table 7 summarizes the present (1980) and projected (2000) quantity of flow treated by publicly owned treatment plants that is of industrial origin. This summary is an extension of the summary presented in Table 6.

A further explanation of these summaries is presented below:

Actual: All flows reported in this category are compiled from the Actual Average Daily Flow received at treatment works during the most recent 12 month period for which information is available. Flows reported in this category were compiled from records collected between late 1978 and early 1980. The major source of flow information was the self-monitoring reports that are completed by every facility with an NPDES permit.

Present Design: All flows reported in this category are compiled from the average daily flow a treatment plant is designed to handle. The design capacity reported was the capacity in place in 1980.

Projected Design: All flows in this category are compiled from the average daily flow that a treatment plant will be designed to handle in the year 2000.

Total Flow: The total fow is expressed in thousands of cubic meters per day. Total flow is defined as all wastewaters moving through the treatment plant from all sources; including domestic, commercial, industrial, and infiltration/inflow.

Industrial Flow: This includes only wastewater generated by industry. Excluded are flows originating from domestic sources, commercial users, and infiltration/inflow.

Percent Change: This category presents a comparison between the present situation (1980) and the projected situation (2000). The change in each parameter between the Present Design and the Projected Design is expressed as an increase or decrease using the Present Design as the base.

All flows are reported in thousands of cubic meters per day.

	ACTUAL			PRESENT DESIGN			PROJECTED DESIGN			PERCENT CHANGE	
STATE	TOTAL FLOW	IND. FLOW	IND. %	TOTAL FLOW	IND. FLOW	IND. %	TOTAL FLOW	IND. FLOW	IND. %	TOTAL FLOW	IND. FLOW
ALABAMA	1,262	230	18.2	1,726	240	13.9	1,998	330	16.5	+15.7	+37.4
ALASKA	135	14	10.6	220	18	8.3	363	19	5.2	+64.9	+3.4
ARIZONA	755	26	3.5	1,043	49	4.7	1,416	24	1.7	+35.7	-49.8
ARKANSAS	631	119	18.8	1,015	114	11.2	1,246	153	12.3	+22.7	+33.8
CALIFORNIA	8,739	1,506	17.2	11,909	2,084	17.5	12,804	2,238	17.4	+7.5	+7.3
COLORADO	1,168	194	16.6	1,619	230	14.2	1,951	238	12.2	+20.4	+3.6
CONNECTICUT	1,358	235	17.3	2,067	442	21.3	2,084	397	19.0	+0.7	-10.2
DELAWARE	317	140	44.3	425	143	33.8	595	159	26.8	+40.0	+11.0
DIST. OF COLUM.	1,128	0	0.0	1,169	0	0.0	1,169	0	0.0	+0.0	+0.0
FLORIDA	2,343	206	8.8	4,053	278	6.8	7,038	425	6.0	+73.6	+53.0
GEORGIA	1,933	443	22.9	3,140	616	19.6	3,668	783	21.3	+16.8	+27.1
HAWAII	363	38	10.5	587	34	6.2	757	53	7.0	+38.3	+56.6
IDAHO	343	61	18.0	541	83	15.4	684	85	12.5	+26.5	+2.2
ILLINOIS	7,745	1,509	19.4	9,655	1,878	19.4	11,086	2,212	19.9	+14.8	+17.7
INDIANA	2,723	570	20.9	3,853	805	20.8	4,156	941	22.6	+7.8	+16.9
IOWA	1,161	198	17.0	1,047	242	16.7	1,697	331	19.5	+17.2	+36.8
KANSAS	848	124	14.6	1,228	193	15.7	1,383	209	15.1	+12.6	+8.1
KENTUCKY	990	235	23.7	1,307	326	24.9	2,107	544	25.8	+61.2	+66.9
LOUISIANA	1,304	41	3.1	1,914	53	2.7	2,390	123	5.1	+24.8	+130.8
MAINE	418	94	22.5	525	113	21.5	660	120	18.2	+25.5	+5.9
MARYLAND	1,347	210	15.6	2,007	213	10.6	2,536	356	14.0	+26.3	+67.1
MASSACHUSETTS	3,235	759	23.4	3,942	972	24.6	4,794	1,202	25.0	+21.6	+23.6
MICHIGAN	5,332	1,156	21.6	6,782	713	10.5	8,359	1,800	21.5	+23.2	+152.5
MINNESOTA	1,586	465	29.3	2,052	528	25.7	2,435	662	27.2	+18.6	+25.4
MISSISSIPPI	952	118	12.4	1,139	89	7.8	1,341	136	10.1	+17.7	+52.3
MISSOURI	2,199	400	18.2	3,430	723	21.0	3,419	778	22.7	-0.3	+7.5
MONTANA	246	7	2.9	399	9	2.2	446	14	3.2	+11.8	+60.9
NEBRASKA	658	144	21.9	987	169	17.1	1,070	264	24.7	+8.3	+56.4
NEVADA	576	0	0.0	709	0	0.0	873	19	2.2	+23.1	+5000.0
NEW HAMPSHIRE	284	76	27.0	509	107	21.1	864	180	22.4	+57.7	+67.7
NEW JERSEY	3,959	834	21.0	4,793	476	9.9	5,639	1,343	23.8	+17.6	+181.6
NEW MEXICO	388	24	6.3	524	24	4.5	686	27	3.9	+30.8	+13.5
NEW YORK	9,396	887	9.4	11,473	1,190	10.3	13,813	1,622	11.7	+20.4	+36.2
NORTH CAROLINA	1,681	604	35.9	2,570	737	28.6	3,278	1,023	31.2	+27.5	+38.7
NORTH DAKOTA	149	12	8.3	156	13	8.4	216	19	9.1	+38.5	+50.0
OHIO	5,439	1,040	19.1	7,104	1,417	19.9	8,293	1,926	23.2	+16.7	+35.8
OKLAHOMA	927	80	8.6	1,308	94	7.2	1,658	123	7.4	+26.7	+31.3
OREGON	1,052	244	23.2	1,646	306	18.5	1,938	289	14.9	+17.6	-5.4
PENNSYLVANIA	5,368	767	14.3	6,531	889	13.6	8,113	1,075	13.2	+24.2	+20.8
RHODE ISLAND	458	155	33.9	640	181	28.3	831	255	30.6	+29.8	+40.4
SOUTH CAROLINA	945	259	27.4	1,400	307	21.9	1,788	500	27.9	+27.6	+62.4
SOUTH DAKOTA	209	29	13.8	268	30	11.3	316	37	11.8	+17.9	+23.2
TENNESSEE	1,709	483	28.2	2,559	652	25.4	3,329	940	28.2	+30.0	+44.1
TEXAS	5,596	515	9.2	7,186	576	8.0	9,110	789	8.6	+26.7	+36.8
UTAH	808	65	8.0	1,024	111	10.9	1,088	94	8.6	+6.2	-15.3
VERMONT	168	17	10.4	217	16	7.6	245	27	11.2	+12.9	+65.4
VIRGINIA	1,635	168	10.2	2,458	429	17.4	3,162	570	18.0	+28.6	+32.8
WASHINGTON	1,604	203	12.6	2,212	252	11.4	3,033	377	12.4	+37.1	+49.6
WEST VIRGINIA	387	61	15.8	611	69	11.3	1,065	123	11.5	+74.3	+77.4
WISCONSIN	2,406	599	24.9	3,461	974	28.1	3,738	1,065	28.5	+8.0	+9.3
WYOMING	172	1	0.7	170	0	0.2	285	4	3.3	+67.6	+2429.9
AMERICAN SAMOA	1	0	0.0	5	0	0.0	24	10	44.0	+458.4	+0.0
GUAM	24	0	0.0	98	0	0.0	87	0	0.0	-11.4	+0.0
N. MARIANAS	2	0	0.0	4	0	0.0	21	0	0.0	+330.7	+0.0
PUERTO RICO	517	48	9.4	412	48	11.8	1,344	241	17.9	+226.3	+396.3
PAC. TR. TERR.	1	0	0.0	12	0	0.6	37	0	0.2	+209.6	+0.0
VIRGIN ISLANDS	14	0	0.0	32	0	0.0	43	0	0.0	+35.0	+0.0
U.S. TOTALS	97,117	16,438	16.9	130,260	20,278	15.5	158,540	27,305	17.2	+21.7	+34.6

NOTES: 1. FLOWS IN CUBIC METERS X 1000 2. SUM OF ENTRIES MAY NOT EQUAL TOTALS DUE TO ROUND-OFFS

Table 8

Projected Industrial Flow to Municipal Treatment Plants by Number, Flow, and Percent of Total Flow

Table 8 summarizes the industrial flows expected at municipal plants in the year 2000. A summary is provided for each State and U.S. Territory. National totals are summarized at the bottom of the table. Table 8 is an extension of the Projected Design portion of Table 7.

In the first column the total number of projected treatment plants in each State is reported along with the total wastewater treatment capacity they will represent. The Projected Design Flow for each plant was used to calculate the total treatment capacity value.

Subsequent columns provide a breakdown of the plants that will be receiving industrial flows into five flow ranges. The ranges are specified in the column headings and are reported in thousands of cubic meters per day and, in parentheses under the headings, in millions of gallons per day.

Reported for each flow range are the number of plants in the range that will be receiving industrial flows and the total amount of industrial flow expected. Also reported is the percentage of the total State treatment capacity that is accounted for by the industrial flow.

All flows in the columns are given in thousands of cubic meters per day.

The data indicate that the largest percentage of industrial flows will be treated by plants in the 1 to 50 mgd ranges.

CUBIC METERS/DAY X 1000 (MILLION GALLONS PER DAY)			0-.40 (0-.105)			.401-4.0 (.106-1.05)			4.001-40 (1.06-10.5)			40.001-190 (10.57-50.2)			190+ (50.2+)		
STATE	NUMBER AND FLOW OF TREATMENT FACILITIES		NUMBER OF PLANTS	TOTAL INDUS FLOW	% OF TOTAL FLOW	NUMBER OF PLANTS	TOTAL INDUS FLOW	% OF TOTAL FLOW	NUMBER OF PLANTS	TOTAL INDUS FLOW	% OF TOTAL FLOW	NUMBER OF PLANTS	TOTAL INDUS FLOW	% OF TOTAL FLOW	NUMBER OF PLANTS	TOTAL INDUS FLOW	% OF TOTAL FLOW
ALABAMA	341	1,998	113	9	0.49	35	57	2.88	20	262	13.14	0	0	0.00	0	0	0.00
ALASKA	125	365	3	0	0.19	1	0	0.26	1	17	4.79	0	0	0.00	0	0	0.00
ARIZONA	152	1,416	1	0	0.00	4	7	0.51	2	17	1.23	0	0	0.00	0	0	0.00
ARKANSAS	623	1,246	17	2	0.19	22	39	3.17	15	111	8.94	0	0	0.00	0	0	0.00
CALIF.	946	12,804	50	9	0.07	69	106	0.83	45	699	5.46	10	984	7.69	2	437	3.42
COLORADO	297	1,951	9	1	0.07	15	19	1.01	7	46	2.40	1	170	8.72	0	0	0.00
CONN.	89	2,084	12	2	0.11	35	64	3.11	20	212	10.20	2	117	5.63	0	0	0.00
DELAWARE	23	595	5	0	0.16	3	3	0.66	1	9	1.52	1	145	24.45	0	0	0.00
WASH. D.C.	1	1,169	0	0	0.00	0	0	0.00	0	0	0.00	0	0	0.00	0	0	0.00
FLORIDA	326	7,038	106	11	0.16	11	20	0.29	15	177	2.52	2	215	3.06	0	0	0.00
GEORGIA	436	3,668	112	10	0.29	51	74	2.02	30	367	10.00	3	133	3.63	1	197	5.37
HAWAII	40	757	1	0	0.01	3	6	0.80	0	0	0.00	1	47	6.24	0	0	0.00
IDAHO	199	684	8	1	0.18	9	14	2.06	4	70	10.25	0	0	0.00	0	0	0.00
ILLINOIS	846	11,086	67	12	0.11	86	156	1.40	31	464	4.18	6	593	5.35	2	986	8.89
INDIANA	586	4,156	59	7	0.17	41	73	1.76	35	596	14.35	3	264	6.37	0	0	0.00
IOWA	846	1,697	23	3	0.19	20	30	1.77	20	254	14.97	1	44	2.60	0	0	0.00
KANSAS	607	1,385	21	2	0.21	22	34	2.50	5	51	3.73	2	120	8.69	0	0	0.00
KENTUCKY	399	2,107	136	10	0.51	36	52	2.46	8	79	3.77	3	402	19.08	0	0	0.00
LOUISIANA	447	2,390	16	2	0.09	6	12	0.52	7	106	4.55	0	0	0.00	0	0	0.00
MAINE	204	660	17	2	0.42	19	32	4.85	13	85	12.94	0	0	0.00	0	0	0.00
MARYLAND	347	2,536	50	4	0.16	14	16	0.64	9	124	4.91	3	211	8.32	0	0	0.00
MASS.	137	4,794	13	2	0.05	42	73	1.52	23	286	5.97	4	440	9.18	1	314	6.55
MICHIGAN	513	8,359	60	8	0.10	35	59	0.71	18	263	3.15	4	541	6.47	1	927	11.09
MINNESOTA	585	2,435	72	10	0.42	54	72	2.98	10	112	4.62	2	103	4.26	1	363	14.91
MISS.	520	1,341	83	6	0.49	27	38	2.89	10	90	6.77	0	0	0.00	0	0	0.00
MISSOURI	696	3,419	64	8	0.26	58	77	2.27	15	164	4.80	2	116	3.41	2	410	12.01
MONTANA	176	446	10	1	0.35	4	8	1.98	1	4	0.93	0	0	0.00	0	0	0.00
NEBRASKA	464	1,070	14	2	0.22	17	25	2.38	7	87	8.15	2	149	14.00	0	0	0.00
NEVADA	73	873	1	0	0.04	0	0	0.00	1	18	2.16	0	0	0.00	0	0	0.00
NEW HAMP.	143	804	16	3	0.47	19	40	5.00	8	90	11.27	1	46	5.74	0	0	0.00
NEW JERSEY	162	5,659	21	4	0.07	43	72	1.28	26	287	5.09	6	411	7.28	1	567	10.06
NEW MEXICO	172	686	4	0	0.13	5	9	1.35	1	17	2.50	0	0	0.00	0	0	0.00
NEW YORK	828	13,813	135	21	0.15	71	103	0.74	55	634	4.59	7	560	4.05	1	302	2.19
N CAROLINA	656	3,278	149	16	0.50	67	100	3.07	58	734	22.39	3	171	5.22	0	0	0.00
N DAKOTA	312	216	5	1	0.64	4	7	3.23	1	11	5.24	0	0	0.00	0	0	0.00
OHIO	795	8,293	48	9	0.10	60	124	1.49	42	463	5.58	12	1,329	16.03	0	0	0.00
OKLAHOMA	664	1,658	11	1	0.10	20	36	2.17	4	86	5.19	0	0	0.00	0	0	0.00
OREGON	236	1,936	9	1	0.08	13	16	0.87	3	59	3.05	2	211	10.93	0	0	0.00
PENN.	1,262	8,113	223	23	0.29	92	125	1.55	35	330	4.07	7	595	7.33	0	0	0.00
RHODE IS	26	831	1	0	0.03	9	20	2.48	3	37	4.55	3	196	23.61	0	0	0.00
S CAROLINA	282	1,788	102	11	0.64	56	84	4.71	29	347	19.41	1	57	3.19	0	0	0.00
S DAKOTA	287	316	9	1	0.33	12	18	5.72	1	18	5.78	0	0	0.00	0	0	0.00
TENNESSEE	291	3,329	90	8	0.26	50	82	2.48	16	200	6.02	3	370	11.11	1	277	8.34
TEXAS	2,176	9,110	64	11	0.12	70	107	1.17	24	270	2.97	4	198	2.10	1	200	2.20
UTAH	198	1,088	53	3	0.31	7	15	1.41	5	75	6.97	0	0	0.00	0	0	0.00
VERMONT	103	245	14	1	0.75	13	19	7.91	1	6	2.54	0	0	0.00	0	0	0.00
VIRGINIA	306	3,162	56	6	0.21	32	41	1.32	19	192	6.07	4	329	10.42	0	0	0.00
WASHINGTON	340	3,033	17	3	0.12	14	20	0.66	11	153	5.04	2	200	6.61	0	0	0.00
W VIRGINIA	534	1,065	220	22	2.08	19	25	2.34	4	76	7.13	0	0	0.00	0	0	0.00
WISCONSIN	631	3,738	135	19	0.52	85	127	3.39	22	342	9.15	4	274	7.33	1	302	8.10
WYOMING	119	285	3	0	0.14	2	1	0.35	1	8	2.85	0	0	0.00	0	0	0.00
AMER SAMOA	5	24	0	0	0.00	0	0	0.00	1	10	44.00	0	0	0.00	0	0	0.00
GUAM	6	87	0	0	0.00	0	0	0.00	0	0	0.00	0	0	0.00	0	0	0.00
N MARIANAS	3	21	0	0	0.00	0	0	0.00	0	0	0.00	0	0	0.00	0	0	0.00
PUER. RICO	31	1,344	8	1	0.12	10	9	0.70	9	182	13.54	1	48	3.61	0	0	0.00
PAC TR TER	23	37	1	0	0.20	0	0	0.00	0	0	0.00	0	0	0.00	0	0	0.00
VIRGIN IS	4	43	0	0	0.00	0	0	0.00	0	0	0.00	0	0	0.00	0	0	0.00
US TOTAL	21,639	158,540	2542	317	0.19	1,510	2,387	1.50	750	9,421	5.94	120	9,804	6.18	15	5,374	3.39

Table 9

Percent of Flows at all Treatment Levels - Existing and Planned - National Summary

Table 9 summarizes the degree of treatment received by all wastewater collected in the U.S. at present (1980) and projected (2000).

Explanations of the categories and definitions of terms follow:

Existing Facilities: Pertains to treatment plants that were operational in 1980. New treatment plants under construction in 1980 and plants planned to be constructed by 2000 are not included in this category.

Actual 1980 Flow: Compiled from the actual average daily flow received at a treatment plant during the most recent 12 month period for which information was available.

Present Design: Refers to the average flow that a treatment plant is currently (1980) designed to accommodate.

Projected Design: Refers to the average daily flow that a treatment plant will be designed to accomodate in the year 2000.

Planned Facilities: Treatment plants that were not operational in 1980 but are expected to be operational by the year 2000. Included are new treatment plants that were under construction in 1980.

All Facilities (2000): Includes all treatment plants that will be operational in 2000. This includes facilities presently on line that will remain operational through 2000, new facilities under construction in 1980, and new facilities planned to be built by 2000. Excluded are facilities that are presently on line but are to be taken out of service by 2000.

All flows are reported in thousands of cubic meters per day.

Definitions of the levels of treatment; no discharge, primary, secondary, etc., are given in subsequent tables that summarizes information for each level of treatment.

Communities that discharge untreated or raw sewage are not included in this summary.

EXISTING FACILITIES

		NO DISCHARGE	PRIMARY	ADVANCED PRIMARY	SECONDARY	ADVANCED SECONDARY	AWT TERTIARY	TOTAL
FACILITIES:	COUNT	1,361	1,043	2,300	7,852	2,443	251	15,250
	% OF TOTAL	8.9	6.8	15.0	51.4	16.0	1.6	
ACTUAL 1980 FLOW:	CUBIC METERS/1000	1,659	11,489	10,958	37,404	32,759	2,845	97,116
	MGD	438	3,035	2,894	9,881	8,654	751	25,655
	% OF TOTAL	1.7	11.8	11.2	38.5	33.7	2.9	
PRESENT DESIGN:	CUBIC METERS/1000	2,415	13,521	13,015	51,809	44,962	4,534	130,256
	MGD	638	3,571	3,438	13,686	11,877	1,197	34,410
	% OF TOTAL	1.8	10.3	9.9	39.7	34.5	3.5	
PROJECTED DESIGN:	CUBIC METERS/1000	3,582	0	0	58,744	66,744	14,835	143,907
	MGD	946	0	0	15,518	17,632	3,919	38,016
	% OF TOTAL	2.4	0.0	0.0	40.8	46.3	10.3	

PLANNED FACILITIES

		NO DISCHARGE	PRIMARY	ADVANCED PRIMARY	SECONDARY	ADVANCED SECONDARY	AWT TERTIARY	TOTAL
FACILITIES:	COUNT	863	0	0	4,719	2,299	185	8,066
	% OF TOTAL	10.7	0.0	0.0	58.5	28.5	2.2	
PROJECTED DESIGN:	CUBIC METERS/1000	744	0	0	7,852	5,249	790	14,637
	MGD	196	0	0	2,074	1,386	208	3,866
	% OF TOTAL	5.0	0.0	0.0	53.6	35.8	5.4	

ALL FACILITIES (2000)

		NO DISCHARGE	PRIMARY	ADVANCED PRIMARY	SECONDARY	ADVANCED SECONDARY	AWT TERTIARY	TOTAL
FACILITIES:	COUNT	2,366	0	0	11,903	6,543	826	21,638
	% OF TOTAL	10.9	0.0	0.0	55.0	30.2	3.8	
PROJECTED DESIGN:	CUBIC METERS/1000	4,326	0	0	66,593	71,993	15,626	158,540
	MGD	1,143	0	0	17,592	19,018	4,127	41,881
	% OF TOTAL	2.7	0.0	0.0	42.0	45.4	9.8	

Plant Loadings, Removal Efficiencies, and Discharge Rates for Facilities Existing in 1980

(Metric Tons per Day)

Table 10 is the first of a number of related tables found in this report. It is designed to estimate the average daily pollutant load received by all treatment plants and to estimate the amount of pollutants in the effluent. A total is estimated for each State and U.S. Territory. A national total is provided at the bottom of the table.

Quantities of pollutant in the influent and effluent are estimated for the BOD and Solids. Quantities are given in metric tons per day. The quantities are calculated using the average daily flow and the average BOD and Solids concentrations, along with appropriate conversion factors. The average values are compiled from the most recent 12 month period for which information is available. The major source of flow and concentration information was the self-monitoring reports that are completed by every facility with an NPDES permit.

Plants With Removal Capabilities are facilities with a specific requirement to remove the listed nutrient. For instance, some phosphorus is removed in all treatment plants. However, only plants specifically designed to remove phosphorus are reported in this category. Reported for each nutrient are the total number of plants with removal capabilities and the total average daily flow received by these plants. Also given is the percentage of the total State flow these plants represent. All flows are reported in thousands of cubic meters per day.

Total Flow is the sum of the actual average daily flows treated by all facilities within the State, regardless of the degree of treatment.

Excluded from this summary are facilities with no discharge to suface waters and communities discharging raw sewage. For this reason the total flow listed on this table does not match the total actual average daily flows listed on Tables 6 and 7.

		REMOVAL EFFICIENCIES						PLANTS WITH REMOVAL CAPABILITY								
		BOD5			SOLIDS			PHOSPHORUS			NH3 NITROGEN			TOTAL N		
STATE	TOTAL FLOW	INF.	EFF.	% REM.	INF.	EFF.	% REM.	# PLANTS	FLOW	% TOT. FLOW	# PLANTS	FLOW	% TOT. FLOW	# PLANTS	FLOW	% TOT. FLOW
ALABAMA	1,262	213	39	81.4	237	45	80.7	0	0	0.0	18	278	22.0	0	0	0.0
ALASKA	135	20	8	58.9	26	8	66.4	0	0	0.0	0	0	0.0	0	0	0.0
ARIZONA	697	138	24	82.1	150	28	80.8	0	0	0.0	0	0	0.0	0	0	0.0
ARKANSAS	630	165	22	86.2	182	43	75.9	0	0	0.0	0	0	0.0	0	0	0.0
CALIFORNIA	7,941	2,303	738	67.9	2,576	626	75.6	11	458	5.7	13	901	11.3	4	131	1.6
COLORADO	1,164	261	25	90.1	269	24	90.8	5	7	0.6	3	11	1.0	0	0	0.0
CONNECTICUT	1,357	197	44	77.5	199	37	81.2	1	4	0.3	0	0	0.0	0	0	0.0
DELAWARE	317	56	8	84.6	61	16	73.6	0	0	0.0	0	0	0.0	0	0	0.0
DIST. OF COLUM.	1,128	168	32	80.5	181	33	81.3	1	1,128	100.0	1	1,128	100.0	0	0	0.0
FLORIDA	2,312	427	70	83.5	430	67	84.2	19	367	15.9	16	168	7.2	5	193	8.3
GEORGIA	1,932	370	54	85.2	342	90	73.5	12	112	5.8	24	200	10.3	1	2	0.1
HAWAII	362	78	64	18.4	69	52	24.2	0	0	0.0	0	0	0.0	0	0	0.0
IDAHO	328	76	11	85.4	71	10	85.3	0	0	0.0	2	42	12.8	0	0	0.0
ILLINOIS	7,745	1,103	99	90.9	1,429	123	91.3	31	242	3.1	36	4,679	60.4	5	54	0.6
INDIANA	2,723	465	56	87.7	543	65	87.9	45	919	33.7	9	748	27.4	0	0	0.0
IOWA	1,161	399	79	80.1	365	69	80.9	0	0	0.0	7	42	3.6	0	0	0.0
KANSAS	816	195	40	79.2	207	41	79.9	0	0	0.0	0	0	0.0	0	0	0.0
KENTUCKY	990	236	65	72.3	289	60	79.1	0	0	0.0	40	137	13.8	0	0	0.0
LOUISIANA	1,303	253	46	81.4	267	45	82.8	0	0	0.0	1	5	0.4	1	5	0.4
MAINE	418	97	25	74.1	95	20	78.8	1	0	0.1	0	0	0.0	0	0	0.0
MARYLAND	1,347	332	71	78.4	300	60	79.6	8	704	52.2	4	89	6.6	1	4	0.3
MASSACHUSETTS	3,235	520	271	47.8	565	221	60.8	5	43	1.3	5	62	1.9	1	10	0.3
MICHIGAN	5,301	1,430	164	80.4	2,507	263	89.5	111	4,657	87.8	19	581	10.9	1	11	0.2
MINNESOTA	1,583	411	52	87.1	461	53	88.3	16	149	9.4	0	0	0.0	0	0	0.0
MISSISSIPPI	952	179	24	86.1	204	39	80.8	1	0	0.0	14	25	2.6	0	0	0.0
MISSOURI	2,198	485	188	61.2	556	146	73.7	0	0	0.0	1	66	3.0	0	0	0.0
MONTANA	240	43	7	81.8	37	7	79.1	0	0	0.0	0	0	0.0	0	0	0.0
NEBRASKA	639	194	76	60.5	199	71	64.1	0	0	0.0	0	0	0.0	0	0	0.0
NEVADA	375	29	4	85.8	33	2	91.2	2	322	85.9	1	68	18.3	0	0	0.0
NEW HAMPSHIRE	283	64	21	66.0	60	14	75.2	1	0	0.2	1	0	0.2	0	0	0.0
NEW JERSEY	3,959	892	517	42.0	904	295	67.3	4	29	0.7	7	91	2.3	1	22	0.5
NEW MEXICO	333	69	19	71.2	69	14	78.3	1	5	1.6	0	0	0.0	0	0	0.0
NEW YORK	9,395	1,280	463	63.8	1,277	414	67.5	19	422	4.5	14	56	0.6	6	99	1.0
NORTH CAROLINA	1,681	392	48	87.7	309	58	81.1	2	6	0.3	51	452	26.9	0	0	0.0
NORTH DAKOTA	147	34	2	93.8	32	3	88.0	0	0	0.0	0	0	0.0	0	0	0.0
OHIO	5,439	1,003	181	81.8	1,223	209	82.8	53	768	14.1	89	572	10.5	0	0	0.0
OKLAHOMA	898	188	25	86.6	204	31	84.7	4	73	8.1	4	73	8.1	0	0	0.0
OREGON	1,043	210	22	89.1	219	30	86.1	2	47	4.5	1	19	1.8	0	0	0.0
PENNSYLVANIA	5,368	938	241	74.2	1,114	302	72.8	72	637	11.8	91	368	6.8	2	7	0.1
RHODE ISLAND	458	68	17	73.7	68	20	70.3	0	0	0.0	0	0	0.0	0	0	0.0
SOUTH CAROLINA	945	258	45	82.4	197	45	76.7	2	5	0.5	20	149	15.8	0	0	0.0
SOUTH DAKOTA	205	53	8	84.7	49	8	83.2	0	0	0.0	1	3	1.6	0	0	0.0
TENNESSEE	1,709	526	84	83.9	515	117	77.2	0	0	0.0	37	475	27.8	0	0	0.0
TEXAS	5,303	1,174	118	89.9	1,207	187	84.4	18	76	1.4	38	145	2.7	1	1	0.0
UTAH	783	110	15	85.9	113	16	85.1	0	0	0.0	0	0	0.0	0	0	0.0
VERMONT	167	29	13	53.1	25	9	63.3	2	1	0.6	1	9	5.8	0	0	0.0
VIRGINIA	1,635	318	59	81.3	308	49	84.0	14	304	18.6	4	192	11.7	1	2	0.1
WASHINGTON	1,587	311	116	62.6	331	82	75.1	1	102	6.4	2	5	0.3	1	0	0.0
WEST VIRGINIA	387	90	27	69.7	86	20	76.7	2	7	1.8	7	29	7.6	4	28	7.2
WISCONSIN	2,387	556	71	87.2	577	88	84.7	59	1,510	63.2	31	116	4.8	0	0	0.0
WYOMING	170	34	8	74.9	35	9	74.5	0	0	0.0	0	0	0.0	0	0	0.0
AMERICAN SAMOA	1	0	0	3.1	0	0	4.7	0	0	0.0	0	0	0.0	0	0	0.0
GUAM	23	5	5	5.9	5	5	6.3	0	0	0.0	0	0	0.0	0	0	0.0
N. MARIANAS	2	0	0	68.7	0	0	41.6	0	0	0.0	0	0	0.0	0	0	0.0
PUERTO RICO	517	135	53	60.2	116	32	72.0	0	0	0.0	0	0	0.0	0	0	0.0
PAC. TR. TERR.	1	0	0	82.3	0	0	80.5	0	0	0.0	0	0	0.0	0	0	0.0
VIRGIN ISLANDS	14	2	1	33.8	3	2	27.8	0	0	0.0	0	0	0.0	0	0	0.0
U.S. TOTALS	95,457	19,608	4,613	76.4	21,920	4,452	79.6	525	13,117	13.7	609	12,003	12.5	35	574	0.6

NOTES: 1. FLOWS IN CUBIC METERS X 1000 2. METRIC TONS X .9072 = SHORT TONS

3. SUM OF ENTRIES MAY NOT EQUAL TOTALS DUE TO ROUND-OFFS

4. FACILITIES WITH ZERO DISCHARGE OR RAW DISCHARGE ARE NOT INCLUDED

Table 11

Plant Loadings, Removal Efficiencies and Discharge Rates for Facilities Projected for 2000

(Metric Tons per Day)

Table 11 is a companion to the summary provided in Table 10. This table summmarizes the year 2000 situation with regard to flows, pollutant loadings, and removal efficiencies. All flows and quantities are estimated using the Projected Design Flow and the Projected Level of Treatment for treatment plants expected to be operational in the year 2000.

Quantities of pollutant in the influent and effluent are estimated for the BOD and Solids. Quantities are given in metric tons per day. The quantities are calculated using the average daily flow and the average daily BOD and Solids concentrations, along with appropriate conversion factors. The average values used for this summary represent the projected year 2000 situation.

Plants With Removal Capabilities are facilities with a specific requirement to remove the listed nutrient. For instance, some phosphorus is removed in all treatment plants. However, only plants specifically designed to remove phosphorus are reported in this category. Reported for each nutrient are the total number of plants with removal capabilities and the total average daily flow to be received by these plants in the year 2000. Also given is the percentage of the total State flow these plants will represent. All flows are reported in thousands of cubic meters per day.

Total Flow is the sum of the actual average daily flows treated by all facilities within the State, regardless of the degree of treatment.

Excluded from this summary are facilities with no discharge to surface waters and communities discharging raw sewage. For this reason the total flow listed on this table does not match the total projected design flows listed on Tables 6 and 7.

		REMOVAL EFFICIENCIES						PLANTS WITH REMOVAL CAPABILITY								
		BOD5			SOLIDS			PHOSPHORUS			NH3 NITROGEN			TOTAL N		
STATE	TOTAL FLOW	INF.	EFF.	% REM.	INF.	EFF.	% REM.	# PLANTS	FLOW	% TOT. FLOW	# PLANTS	FLOW	% TOT. FLOW	# PLANTS	FLOW	% TOT. FLOW
ALABAMA	1,998	428	46	89.0	435	59	86.3	0	0	0.0	118	800	40.0	0	0	0.0
ALASKA	363	62	10	83.1	72	10	84.9	0	0	0.0	0	0	0.0	0	0	0.0
ARIZONA	1,174	269	35	86.9	262	36	86.1	1	0	0.0	0	0	0.0	0	0	0.0
ARKANSAS	1,244	294	22	92.3	276	27	90.0	1	47	3.8	0	0	0.0	0	0	0.0
CALIFORNIA	11,170	3,274	251	92.3	3,430	252	92.6	10	683	6.1	16	1,387	12.4	4	362	3.2
COLORADO	1,927	461	48	89.4	460	48	89.4	7	63	3.3	25	979	50.7	0	0	0.0
CONNECTICUT	2,083	406	55	86.4	409	53	86.9	12	299	14.3	9	243	11.6	1	16	0.8
DELAWARE	595	140	8	94.2	137	11	91.5	6	74	12.5	1	11	1.9	0	0	0.0
DIST. OF COLUM.	1,169	280	5	97.9	280	8	97.0	1	1,169	100.0	1	1,169	100.0	1	1,169	100.0
FLORIDA	6,286	1,304	133	89.7	1,378	140	89.7	35	1,355	21.5	117	839	13.3	10	639	10.1
GEORGIA	3,663	778	72	90.6	736	100	86.3	28	502	13.7	148	2,050	55.9	3	41	1.1
HAWAII	717	187	21	88.6	151	21	85.9	0	0	0.0	0	0	0.0	0	0	0.0
IDAHO	602	141	14	89.4	136	16	87.8	3	15	2.5	9	218	36.2	3	67	11.2
ILLINOIS	11,082	1,806	129	92.8	2,490	155	93.7	51	695	6.2	93	7,918	71.4	10	135	1.2
INDIANA	4,156	831	62	92.5	938	62	93.3	79	1,692	40.7	27	2,233	53.7	1	227	5.4
IOWA	1,694	523	40	92.3	454	54	88.0	0	0	0.0	194	759	44.8	0	0	0.0
KANSAS	1,329	327	37	88.4	352	41	88.2	0	0	0.0	0	0	0.0	0	0	0.0
KENTUCKY	2,107	444	46	89.4	485	57	88.0	2	5	0.2	240	739	35.1	1	1	0.0
LOUISIANA	2,387	536	66	87.6	546	73	86.5	0	0	0.0	1	7	0.3	1	7	0.3
MAINE	650	157	18	88.1	155	18	87.9	13	27	4.1	0	0	0.0	0	0	0.0
MARYLAND	2,536	607	36	93.9	548	36	93.4	23	1,873	73.8	13	1,541	60.7	2	105	4.1
MASSACHUSETTS	4,789	976	126	87.0	1,082	126	88.3	27	714	14.9	20	425	8.8	1	17	0.3
MICHIGAN	8,265	1,570	190	87.8	2,230	204	90.8	190	7,882	95.3	41	1,315	15.9	2	22	0.2
MINNESOTA	2,423	666	41	93.7	707	45	93.5	67	365	15.0	9	1,368	56.4	0	0	0.0
MISSISSIPPI	1,341	277	28	89.6	273	39	85.5	2	0	0.0	286	813	60.6	0	0	0.0
MISSOURI	3,417	789	99	87.4	808	109	86.4	0	0	0.0	1	113	3.3	0	0	0.0
MONTANA	430	78	12	83.8	82	14	82.1	0	0	0.0	2	41	9.6	0	0	0.0
NEBRASKA	1,022	364	30	91.5	360	33	90.5	0	0	0.0	0	0	0.0	0	0	0.0
NEVADA	495	103	10	89.7	99	10	89.2	6	459	92.5	3	182	36.8	4	54	10.9
NEW HAMPSHIRE	773	230	21	90.5	204	21	89.4	8	59	7.6	13	82	10.7	0	0	0.0
NEW JERSEY	5,639	1,641	139	91.5	1,676	141	91.5	16	242	4.3	42	1,076	19.0	10	238	4.2
NEW MEXICO	563	119	16	86.0	119	17	85.6	6	25	4.5	1	0	0.1	0	0	0.0
NEW YORK	13,809	2,630	367	86.0	2,834	378	86.7	77	2,952	21.3	104	693	5.0	25	286	2.0
NORTH CAROLINA	3,278	858	55	93.5	745	94	87.2	12	53	1.6	334	2,040	62.2	2	0	0.0
NORTH DAKOTA	212	54	5	90.2	53	6	88.2	0	0	0.0	0	0	0.0	0	0	0.0
OHIO	8,291	1,769	126	92.8	1,972	141	92.8	200	6,258	75.4	395	5,308	64.0	4	47	0.5
OKLAHOMA	1,565	352	26	92.4	385	34	91.1	4	148	9.5	32	634	40.5	0	0	0.0
OREGON	1,887	466	32	93.1	454	36	92.0	2	132	7.0	1	56	3.0	0	0	0.0
PENNSYLVANIA	8,113	1,706	175	89.7	1,892	202	89.2	225	1,722	21.2	354	2,627	32.3	11	75	0.9
RHODE ISLAND	831	213	21	89.7	190	22	88.2	2	6	0.7	4	168	20.2	0	0	0.0
SOUTH CAROLINA	1,787	481	46	90.2	389	52	86.6	17	69	3.9	75	482	27.0	0	0	0.0
SOUTH DAKOTA	306	87	6	92.0	83	7	91.3	0	0	0.0	14	169	55.4	0	0	0.0
TENNESSEE	3,329	1,014	72	92.8	871	85	90.1	12	3	0.0	143	2,122	63.7	1	22	0.6
TEXAS	8,652	2,055	119	94.1	2,067	148	92.8	23	165	1.9	98	2,295	26.5	1	2	0.0
UTAH	1,047	206	11	94.2	224	10	95.3	0	0	0.0	0	0	0.0	0	0	0.0
VERMONT	243	51	5	89.2	49	5	88.6	25	79	32.7	14	64	26.5	0	0	0.0
VIRGINIA	3,161	724	58	91.9	719	57	92.0	21	874	27.6	11	488	15.4	9	292	9.2
WASHINGTON	2,999	689	79	88.4	737	87	88.1	4	218	7.2	4	586	19.5	2	3	0.1
WEST VIRGINIA	1,065	243	25	89.3	241	26	89.1	3	13	1.2	38	182	17.1	8	43	4.1
WISCONSIN	3,686	894	93	89.5	915	94	89.6	86	2,563	69.5	109	640	17.3	1	2	0.0
WYOMING	283	61	8	86.0	63	9	85.6	0	0	0.0	4	86	30.3	0	0	0.0
AMERICAN SAMOA	24	8	0	90.7	3	0	80.3	0	0	0.0	0	0	0.0	0	0	0.0
GUAM	82	16	2	85.1	18	2	86.8	0	0	0.0	0	0	0.0	0	0	0.0
N. MARIANAS	21	2	0	85.2	2	0	85.2	0	0	0.0	0	0	0.0	0	0	0.0
PUERTO RICO	1,344	372	39	89.2	336	39	88.1	1	16	1.1	3	18	1.3	0	0	0.0
PAC. TR. TERR.	36	7	0	87.0	7	0	87.0	0	0	0.0	0	0	0.0	0	0	0.0
VIRGIN ISLANDS	43	10	1	87.3	11	1	88.7	0	0	0.0	0	0	0.0	0	0	0.0
U.S. TOTALS	154,213	35,063	3,270	90.6	37,062	3,596	90.2	1,308	33,536	21.7	3,069	44,988	29.1	118	3,088	2.5

NOTES: 1. FLOWS IN CUBIC METERS X 1000   2. METRIC TONS X .9072 = SHORT TONS

3. SUM OF ENTRIES MAY NOT EQUAL TOTALS DUE TO ROUND-OFFS

4. FACILITIES WITH ZERO DISCHARGE OR RAW DISCHARGE ARE NOT INCLUDED

16<

Table 12

Treatment Populations—Present and Projected, Resident and Nonresident

(In Thousands)

Table 12 summarizes the populations, by State, for 1980 and 2000 which are now or will be receiving treatment of their wastewaters.

The values listed for the 1980 and 2000 State ceiling populations were obtained from data provided by the Department of Commerce, Bureau of Economic Analysis (BEA). The 1980 total is the BEA estimate of the number of current State residents. The year 2000 total is the population expected to be resident in each State, as predicted by the BEA. The projections were produced by BEA after extensive analysis which included review and comment by State agencies responsible for population projections.

Resident Populations (RES) are permanent residents within the service area of an established sewerage authority. Nonresident populations (NONRES) include commuters living in one service area and working in another, as well as temporary residents at resort areas and similar locations.

Persons are included in the Receiving Treatment category if the wastewater they generate is treated at a facility operated by an established sewerage authority. Persons are included in the Not Receiving Treatment category if they reside in the service area of an established sewerage authority, but the wastewater they generate is not treated at a facility operated by the authority. Theoretically the sum of the populations receiving treatment and not receiving treatment should equal the State's total population. This is not the case because many rural residents who are counted as part of the State's total do not reside in the service area of any established sewerage authority and, therefore, are not included in any Receiving or Not Receiving Treatment categories.

All levels of treatment are included under Receiving Treatment. Similar summaries are presented in subsequent tables that provide information for each specific level of treatment.

The Percent Served values are based upon a comparison between the resident population receiving treatment and the total State population figures provided by BEA.

A similar summary dealing with collection populations is presented in Table 42.

			RECEIVING TREATMENT				NOT RECEIVING TREATMENT				PERCENT SERVED	
STATE	1980 CEILING POPULATION	2000 CEILING POPULATION	1980 RES.	2000 RES.	1980 NONRES.	2000 NONRES.	1980 RES.	2000 RES.	1980 NONRES.	2000 NONRES.	1980	2000
ALABAMA	3,769	4,140	2,002	3,400	103	204	533	75	4	0	53.1	82.1
ALASKA	406	667	201	678	3	19	121	15	3	0	49.7	101.8
ARIZONA	2,450	4,149	1,802	3,844	66	200	374	122	14	2	73.6	92.7
ARKANSAS	2,180	2,970	1,215	2,489	23	47	220	6	0	0	55.7	83.8
CALIFORNIA	22,696	26,786	19,451	26,087	1,042	1,451	1,421	226	43	6	85.7	97.4
COLORADO	2,772	4,371	2,455	4,141	165	528	34	1	0	0	88.6	94.7
CONNECTICUT	3,115	3,741	1,885	2,867	30	47	1,176	859	0	0	60.5	76.7
DELAWARE	582	841	463	821	80	408	79	18	31	0	79.7	97.7
DIST. OF COLUM.	656	661	729	811	1,899	2,339	0	0	0	0	111.2	122.7
FLORIDA	8,860	15,049	4,717	13,185	819	1,760	2,236	405	57	2	53.2	87.6
GEORGIA	5,118	7,053	3,037	5,882	133	227	753	315	4	0	59.4	83.4
HAWAII	915	1,366	585	1,359	99	255	212	13	9	0	64.0	99.6
IDAHO	905	1,183	480	1,047	13	79	99	15	23	3	53.1	88.6
ILLINOIS	11,230	12,358	9,940	11,981	32	46	285	98	0	0	88.5	97.0
INDIANA	5,400	6,059	3,473	4,937	282	501	412	24	54	0	64.3	81.5
IOWA	2,903	3,101	2,095	2,835	69	147	148	9	28	0	72.2	91.4
KANSAS	2,369	2,517	1,822	2,535	13	19	171	8	1	0	76.9	100.7
KENTUCKY	3,527	4,224	1,680	3,336	60	97	760	254	0	0	47.6	79.0
LOUISIANA	4,026	4,659	2,815	4,621	69	103	448	1	6	0	69.9	99.2
MAINE	1,097	1,222	485	941	82	133	631	208	7	0	44.3	77.0
MARYLAND	4,149	5,583	2,441	4,805	127	486	507	131	127	0	58.8	86.1
MASSACHUSETTS	5,769	6,614	3,745	5,767	59	211	1,793	887	82	55	64.9	87.2
MICHIGAN	9,208	10,314	6,778	9,001	123	253	1,428	580	36	17	73.6	87.3
MINNESOTA	4,060	4,505	2,908	3,689	23	40	208	61	6	0	71.6	81.9
MISSISSIPPI	2,406	2,740	1,449	2,423	15	17	405	121	1	0	60.3	88.4
MISSOURI	4,868	5,225	3,432	5,205	878	1,435	297	11	5	0	70.5	99.6
MONTANA	786	938	482	731	32	38	32	0	1	0	61.3	78.0
NEBRASKA	1,574	1,734	1,351	1,855	17	26	57	19	0	0	85.8	107.0
NEVADA	702	1,312	605	1,243	90	190	46	0	0	0	86.3	94.8
NEW HAMPSHIRE	887	1,306	362	951	57	196	417	287	60	28	40.8	72.9
NEW JERSEY	7,332	8,747	5,760	8,480	804	1,537	1,167	208	141	60	78.6	97.0
NEW MEXICO	1,241	1,781	1,034	1,637	16	30	122	43	6	0	83.4	91.9
NEW YORK	17,649	18,922	12,457	17,324	2,388	4,065	5,309	2,130	405	6	70.6	91.6
NORTH CAROLINA	5,606	7,419	2,373	4,474	179	441	1,415	861	103	14	42.3	60.3
NORTH DAKOTA	657	690	434	576	0	0	7	2	0	0	66.2	83.6
OHIO	10,731	12,031	8,297	11,804	66	92	985	68	3	0	77.3	98.1
OKLAHOMA	2,892	3,702	2,135	3,549	2	11	183	14	7	0	73.8	95.9
OREGON	2,527	3,209	1,443	2,972	39	73	338	1	3	0	57.1	92.6
PENNSYLVANIA	11,731	12,365	8,735	12,032	528	1,263	2,538	551	232	11	74.5	97.3
RHODE ISLAND	929	1,033	589	994	88	71	304	126	0	0	63.4	96.3
SOUTH CAROLINA	2,932	3,700	1,291	2,800	233	495	639	105	51	0	44.1	75.7
SOUTH DAKOTA	689	730	454	663	13	10	17	8	0	0	65.9	90.8
TENNESSEE	4,380	5,573	2,163	4,203	68	145	930	261	1	0	49.4	75.4
TEXAS	13,385	18,069	11,042	18,144	311	648	1,045	0	38	0	82.5	100.4
UTAH	1,367	1,688	1,166	1,681	19	38	87	0	6	0	85.3	99.6
VERMONT	493	607	225	388	46	78	126	80	16	7	45.7	64.0
VIRGINIA	5,197	6,755	3,315	5,761	297	470	1,135	545	6	0	63.8	85.3
WASHINGTON	3,926	4,859	2,360	4,292	437	801	582	109	28	19	60.1	88.3
WEST VIRGINIA	1,878	2,003	761	2,052	16	24	1,053	23	3	0	40.6	102.5
WISCONSIN	4,720	5,553	3,479	5,256	72	166	338	148	21	7	73.7	94.7
WYOMING	450	484	328	596	14	27	2	0	1	0	72.9	123.2
AMERICAN SAMOA	31	40	1	36	0	1	30	2	0	0	4.5	90.5
GUAM	114	275	72	215	3	3	18	22	0	0	63.0	78.5
N. MARIANAS	17	31	1	31	0	2	17	1	0	0	8.1	101.0
PUERTO RICO	3,358	4,700	1,757	3,242	0	0	1,184	771	0	0	52.3	69.0
PAC. TR. TERR.	111	174	22	108	0	4	95	64	0	0	20.6	62.2
VIRGIN ISLANDS	96	116	66	106	3	3	20	7	0	0	68.8	91.9
U.S. TOTALS	223,824	272,644	156,673	246,913	12,079	22,028	34,898	10,847	1,698	247	70.0	90.6

Table 13

Septic Tank Population, Present and Projected, Resident and Nonresident

(In Thousands)

Table 13 summarizes the populations, by State, for 1980 and 2000 which are now or will be disposing of their wastewaters by means of individual onsite systems, the majority being of the septic tank/leachfield type.

The values listed for the 1980 and 2000 State ceiling populations were obtained from data provided by BEA.

All the populations are listed under the Not Receiving Treatment category only because they are not being served by centralized collection and treatment facilities. None of the populations listed on this table live within the service district of a sewerage authority with a central collection and treatment system.

Resident Populations (RES) are permanent residents within the boundaries of an incorporated area. Nonresident Populations (NONRES) include commuters living in one service area and working in another, as well as temporary residents at resort areas and similar locations.

The Percent Served values are based upon a comparison between the resident population not receiving treatment and the total State population figures provided by BEA.

			RECEIVING TREATMENT				NOT RECEIVING TREATMENT				PERCENT SERVED	
STATE	1980 CEILING POPULATION	2000 CEILING POPULATION	1980 RES.	2000 RES.	1980 NONRES.	2000 NONRES.	1980 RES.	2000 RES.	1980 NONRES.	2000 NONRES.	1980	2000
ALABAMA	3,769	4,140	0	0	0	0	207	29	2	0	5.5	0.7
ALASKA	406	667	0	0	0	0	35	0	3	0	8.8	0.1
ARIZONA	2,450	4,149	0	0	0	0	148	101	9	2	6.1	2.5
ARKANSAS	2,180	2,970	0	0	0	0	142	6	0	0	6.6	0.2
CALIFORNIA	22,696	26,786	0	0	0	0	489	90	36	6	2.2	0.3
COLORADO	2,772	4,371	0	0	0	0	21	0	0	0	0.8	0.0
CONNECTICUT	3,115	3,741	0	0	0	0	341	354	0	0	11.0	9.5
DELAWARE	582	841	0	0	0	0	16	0	31	0	2.8	0.0
DIST. OF COLUM.	656	661	0	0	0	0	0	0	0	0	0.0	0.0
FLORIDA	8,860	15,049	0	0	0	0	722	18	11	1	8.1	0.1
GEORGIA	5,118	7,053	0	0	0	0	210	69	2	0	4.1	1.0
HAWAII	915	1,366	0	0	0	0	98	13	9	0	10.7	1.0
IDAHO	905	1,183	0	0	0	0	45	5	18	0	5.0	0.5
ILLINOIS	11,230	12,358	0	0	0	0	178	85	0	0	1.6	0.7
INDIANA	5,400	6,059	0	0	0	0	146	1	31	0	2.7	0.0
IOWA	2,903	3,101	0	0	0	0	83	9	27	0	2.9	0.3
KANSAS	2,369	2,517	0	0	0	0	57	3	0	0	2.4	0.2
KENTUCKY	3,527	4,224	0	0	0	0	225	0	0	0	6.4	0.0
LOUISIANA	4,026	4,659	0	0	0	0	275	0	4	0	6.8	0.0
MAINE	1,097	1,222	0	0	0	0	104	5	3	0	9.5	0.5
MARYLAND	4,149	5,583	0	0	0	0	174	33	124	0	4.2	0.6
MASSACHUSETTS	5,769	6,614	0	0	0	0	327	17	18	0	5.7	0.3
MICHIGAN	9,208	10,314	0	0	0	0	499	318	34	11	5.4	3.1
MINNESOTA	4,060	4,505	0	0	0	0	66	30	6	0	1.6	0.7
MISSISSIPPI	2,406	2,740	0	0	0	0	143	1	0	0	6.0	0.1
MISSOURI	4,868	5,225	0	0	0	0	98	11	5	0	2.0	0.2
MONTANA	786	938	0	0	0	0	10	0	1	0	1.3	0.0
NEBRASKA	1,574	1,734	0	0	0	0	18	19	0	0	1.2	1.1
NEVADA	702	1,312	0	0	0	0	39	0	0	0	5.6	0.0
NEW HAMPSHIRE	887	1,306	0	0	0	0	138	0	48	0	15.6	0.0
NEW JERSEY	7,332	8,747	0	0	0	0	280	143	36	0	3.8	1.6
NEW MEXICO	1,241	1,781	0	0	0	0	44	8	6	0	3.6	0.5
NEW YORK	17,649	18,922	0	0	0	0	2,217	1,357	9	3	12.6	7.2
NORTH CAROLINA	5,606	7,419	0	0	0	0	388	20	99	0	6.9	0.3
NORTH DAKOTA	657	690	0	0	0	0	7	2	0	0	1.2	0.3
OHIO	10,731	12,031	0	0	0	0	314	37	3	0	2.9	0.3
OKLAHOMA	2,892	3,702	0	0	0	0	82	7	7	0	2.8	0.2
OREGON	2,527	3,209	0	0	0	0	35	1	1	0	1.4	0.1
PENNSYLVANIA	11,731	12,365	0	0	0	0	1,176	308	226	10	10.0	2.5
RHODE ISLAND	929	1,033	0	0	0	0	71	0	0	0	7.7	0.0
SOUTH CAROLINA	2,932	3,700	0	0	0	0	205	2	48	0	7.0	0.1
SOUTH DAKOTA	689	730	0	0	0	0	14	4	0	0	2.1	0.6
TENNESSEE	4,380	5,573	0	0	0	0	133	0	0	0	3.1	0.0
TEXAS	13,385	18,069	0	0	0	0	424	0	23	0	3.2	0.0
UTAH	1,367	1,688	0	0	0	0	80	0	5	0	5.9	0.0
VERMONT	493	607	0	0	0	0	41	2	6	0	8.5	0.4
VIRGINIA	5,197	6,755	0	0	0	0	794	488	6	0	15.3	7.2
WASHINGTON	3,926	4,859	0	0	0	0	271	10	12	19	6.9	0.2
WEST VIRGINIA	1,878	2,003	0	0	0	0	721	0	3	0	38.4	0.0
WISCONSIN	4,720	5,553	0	0	0	0	177	124	20	7	3.8	2.2
WYOMING	450	484	0	0	0	0	2	0	1	0	0.5	0.0
AMERICAN SAMOA	31	40	0	0	0	0	3	0	0	0	10.0	0.0
GUAM	114	275	0	0	0	0	0	0	0	0	0.0	0.0
N. MARIANAS	17	31	0	0	0	0	9	1	0	0	56.9	4.8
PUERTO RICO	3,358	4,700	0	0	0	0	5	0	0	0	0.2	0.0
PAC. TR. TERR.	111	174	0	0	0	0	49	38	0	0	44.9	22.4
VIRGIN ISLANDS	96	116	0	0	0	0	0	0	0	0	0.0	0.0
U.S. TOTALS	223,824	272,644	0	0	0	0	12,618	3,790	954	65	5.6	1.4

Table 14

Populations Served by Treatment with No Discharge—Present and Projected, Resident and Nonresident

(Population in Thousands)

Table 14 summarizes the populations, by State, for 1980 and 2000 which are now or will be receiving treatment of their wastewaters at facilities that do not discharge to surface waters. The majority of the facilities are lagoon systems designed for evaporation and/or infiltration of the total flow. Also included are facilities that dispose of their effluent by recycling, reuse, spray irrigation, or groundwater recharge.

Also summarized for each State and the nation is the number of no discharge facilities in operation in 1980 and the number expected to be operational in 2000.

The terms total population, resident, nonresident, receiving treatment, not receiving treatment, and percent served are defined in Table 12.

	POPULATION		RECEIVING TREATMENT				NOT RECEIVING TREATMENT				PERCENT SERVED		TREATMENT PLANTS	
STATE	1980 TOTAL	2000 TOTAL	1980 RES.	2000 RES.	1980 NONRES	2000 NONRES	1980 RES.	2000 RES.	1980 NONRES	2000 NONRES	1980	2000	1980	2000
ALABAMA	3,769	4,140	0	0	0	0	0	0	0	0	0.0	0.0	0	0
ALASKA	406	667	0	0	0	0	0	0	0	0	0.0	0.0	0	0
ARIZONA	2,450	4,149	194	633	17	186	39	4	0	0	7.9	15.2	60	84
ARKANSAS	2,180	2,970	3	5	0	0	0	0	0	0	0.1	0.2	5	7
CALIFORNIA	22,696	26,786	1,528	3,058	154	419	255	27	6	0	6.7	11.4	207	621
COLORADO	2,772	4,371	12	57	2	4	0	0	0	0	0.4	1.3	30	26
CONNECTICUT	3,115	3,741	1	0	0	0	6	0	0	0	0.0	0.0	3	1
DELAWARE	582	841	0	0	0	0	0	0	0	0	0.0	0.0	0	0
DIST. OF COLUM.	656	661	0	0	0	0	0	0	0	0	0.0	0.0	0	0
FLORIDA	8,860	15,049	81	1,579	0	162	6	30	0	0	0.9	10.4	9	25
GEORGIA	5,118	7,053	0	7	0	0	0	1	0	0	0.0	0.1	2	1
HAWAII	915	1,366	0	81	2	14	3	0	0	0	0.1	5.9	3	7
IDAHO	905	1,183	22	158	0	15	1	0	0	0	2.5	13.3	26	58
ILLINOIS	11,230	12,358	0	11	0	0	0	0	0	0	0.0	0.0	1	5
INDIANA	5,400	6,059	0	0	0	0	0	0	0	0	0.0	0.0	0	0
IOWA	2,903	3,101	0	2	0	0	0	0	0	0	0.0	0.0	1	3
KANSAS	2,369	2,517	73	123	0	0	0	0	0	0	3.1	4.9	148	221
KENTUCKY	3,527	4,224	0	0	0	0	0	0	0	0	0.0	0.0	0	0
LOUISIANA	4,026	4,659	2	4	0	0	0	0	0	0	0.0	0.1	7	10
MAINE	1,097	1,222	2	26	0	2	0	14	0	0	0.1	2.1	2	31
MARYLAND	4,149	5,583	0	0	0	0	0	0	0	0	0.0	0.0	0	1
MASSACHUSETTS	5,769	6,614	0	7	0	11	0	0	0	0	0.0	0.1	0	2
MICHIGAN	9,208	10,314	73	204	6	33	25	6	0	2	0.8	1.9	44	75
MINNESOTA	4,066	4,505	6	24	0	0	1	0	0	0	0.1	0.5	5	13
MISSISSIPPI	2,406	2,740	0	0	0	0	0	0	0	0	0.0	0.0	0	0
MISSOURI	4,868	5,225	0	4	0	0	0	0	0	0	0.0	0.0	8	16
MONTANA	786	938	16	33	1	2	0	0	0	0	2.1	3.5	27	47
NEBRASKA	1,574	1,734	87	108	2	5	1	0	0	0	3.0	6.2	107	198
NEVADA	702	1,312	368	,84	32	71	4	0	0	0	52.5	59.7	24	46
NEW HAMPSHIRE	887	1,306	0	57	1	38	2	34	0	16	0.0	4.3	1	40
NEW JERSEY	7,332	8,747	0	0	0	0	0	0	0	0	0.0	0.0	0	0
NEW MEXICO	1,241	1,781	186	293	0	0	9	0	0	0	15.0	16.4	52	95
NEW YORK	17,649	18,922	0	10	0	0	0	4	0	0	0.0	0.0	2	5
NORTH CAROLINA	5,606	7,419	0	0	0	0	0	1	0	0	0.0	0.0	0	3
NORTH DAKOTA	657	690	6	8	0	0	0	0	0	0	1.0	1.1	15	24
OHIO	10,731	12,031	0	3	0	0	0	0	0	0	0.0	0.0	0	1
OKLAHOMA	2,892	3,702	91	238	1	0	7	0	0	0	3.1	6.4	132	207
OREGON	2,527	3,209	18	94	3	0	16	0	0	0	0.7	2.9	14	17
PENNSYLVANIA	11,731	12,365	0	0	0	0	0	0	0	0	0.0	0.0	0	0
RHODE ISLAND	929	1,033	0	0	0	0	0	0	0	0	0.0	0.0	0	0
SOUTH CAROLINA	2,932	3,700	0	2	0	0	0	0	0	0	0.0	0.0	0	1
SOUTH DAKOTA	689	730	10	18	0	5	0	0	0	0	1.4	2.5	22	28
TENNESSEE	4,380	5,573	0	0	0	0	0	0	0	0	0.0	0.0	0	0
TEXAS	13,385	18,069	737	1,137	59	108	27	0	0	0	5.5	6.2	219	220
UTAH	1,367	1,688	47	79	0	0	0	0	0	0	3.4	4.7	23	22
VERMONT	493	607	0	1	3	5	1	2	0	0	0.1	0.2	2	5
VIRGINIA	5,197	6,755	0	3	0	0	0	0	0	0	0.0	0.0	0	1
WASHINGTON	3,926	4,859	13	37	0	5	1	0	10	0	0.3	0.7	21	28
WEST VIRGINIA	1,878	2,003	0	0	0	0	0	0	0	0	0.0	0.0	0	0
WISCONSIN	4,720	5,553	37	82	0	32	1	0	0	0	0.7	1.4	47	74
WYOMING	450	484	6	3	0	0	0	0	0	0	1.4	0.8	13	12
AMERICAN SAMOA	31	40	0	0	0	0	0	0	0	0	0.0	0.0	0	0
GUAM	114	275	3	12	0	0	3	3	0	0	3.1	4.6	3	3
N. MARIANAS	17	31	0	0	0	0	0	0	0	0	0.0	0.0	0	0
PUERTO RICO	3,358	4,700	0	0	0	0	0	0	0	0	0.0	0.0	0	0
PAC. TR. TERR.	111	174	0	4	0	0	0	0	0	0	0.0	2.8	0	2
VIRGIN ISLANDS	96	116	0	0	0	0	0	0	0	0	0.0	0.0	0	0
U.S. TOTAL	223,824	272,644	3,599	9,009	290	1,088	416	131	18	19	1.6	3.3	1,361	2,366

Table 15

Populations Served by Raw Discharge—Present and Projected, Resident and Nonresident

(Population in Thousands)

Table 15 summarizes populations served by sewerage authorities that collect wastewater and discharge the wastewater to the environment as a raw waste. The wastewater is not subjected to any treatment beyond what is considered preliminary treatment. Preliminary treatment would include comminution, screening, grit removal, etc., but not primary sedimentation.

All the populations are listed under the Not Receiving Treatment category because the wastewater collected is discharged in the same form as when it was collected.

Also summarized, for each State and the nation, is the number of sewerage authorities utilizing raw discharge as a method of wastewater disposal. In 1980 there were 272 communities discharging raw waste. By the year 2000 all these communities will have built treatment facilities or interceptors to neighboring facilities to eliminate the raw discharge.

	POPULATION		RECEIVING TREATMENT				NOT RECEIVING TREATMENT				PERCENT SERVED		TREATMENT PLANTS	
STATE	1980 TOTAL	2000 TOTAL	1980 RES.	2000 RES.	1980 NONRES	2000 NONRES	1980 RES.	2000 RES.	1980 NONRES	2000 NONRES	1980	2000	1980	2000
ALABAMA	3,769	4,140	0	0	0	0	4	0	0	0	0.1	0.0	3	0
ALASKA	406	667	0	0	0	0	19	0	0	0	4.7	0.0	13	0
ARIZONA	2,450	4,149	0	0	0	0	0	0	0	0	0.0	0.0	0	0
ARKANSAS	2,180	2,970	0	0	0	0	8	0	0	0	0.3	0.0	1	0
CALIFORNIA	22,696	26,786	0	0	0	0	0	0	0	0	0.0	0.0	0	0
COLORADO	2,772	4,371	0	0	0	0	0	0	0	0	0.0	0.0	0	0
CONNECTICUT	3,115	3,741	0	0	0	0	0	0	0	0	0.0	0.0	0	0
DELAWARE	582	841	0	0	0	0	0	0	0	0	0.0	0.0	0	0
DIST. OF COLUM.	656	[illegible]	0	0	0	0	0	0	0	0	0.0	0.0	0	0
FLORIDA	8,860	15,049	0	0	0	0	296	0	46	0	3.3	0.0	4	0
GEORGIA	5,118	7,053	0	0	0	0	7	0	0	0	0.1	0.0	7	0
HAWAII	915	1,366	0	0	0	0	3	0	0	0	0.3	0.0	1	0
IDAHO	905	1,183	0	0	0	0	0	0	0	0	0.0	0.0	1	0
ILLINOIS	11,230	12,358	0	0	0	0	3	0	0	0	0.0	0.0	5	0
INDIANA	5,400	6,059	0	0	0	0	0	0	0	0	0.0	0.0	0	0
IOWA	2,903	3,101	0	0	0	0	0	0	0	0	0.0	0.0	2	0
KANSAS	2,369	2,517	0	0	0	0	0	0	0	0	0.0	0.0	0	0
KENTUCKY	3,527	4,224	0	0	0	0	203	0	0	0	5.7	0.0	4	0
LOUISIANA	4,026	4,659	0	0	0	0	37	0	0	0	0.9	0.0	7	0
MAINE	1,097	1,222	0	0	0	0	113	0	3	0	10.3	0.0	53	0
MARYLAND	4,149	5,583	0	0	0	0	0	0	0	0	0.0	0.0	0	0
MASSACHUSETTS	5,769	6,614	0	0	0	0	208	0	28	0	3.6	0.0	17	0
MICHIGAN	9,208	10,314	0	0	0	0	0	0	0	0	0.0	0.0	1	0
MINNESOTA	4,060	4,505	0	0	0	0	4	0	0	0	0.1	0.0	10	0
MISSISSIPPI	2,406	2,740	0	0	0	0	3	0	0	0	0.1	0.0	2	0
MISSOURI	4,868	5,225	0	0	0	0	0	0	0	0	0.0	0.0	2	0
MONTANA	786	938	0	0	0	0	0	0	0	0	0.0	0.0	0	0
NEBRASKA	1,574	1,734	0	0	0	0	0	0	0	0	0.0	0.0	0	0
NEVADA	702	1,312	0	0	0	0	0	0	0	0	0.0	0.0	0	0
NEW HAMPSHIRE	887	1,306	0	0	0	0	100	0	4	0	11.3	0.0	22	0
NEW JERSEY	7,332	8,747	0	0	0	0	12	0	0	0	0.1	0.0	1	0
NEW MEXICO	1,241	1,781	0	0	0	0	0	0	0	0	0.0	0.0	0	0
NEW YORK	17,649	18,922	0	0	0	0	910	0	344	0	5.1	0.0	19	0
NORTH CAROLINA	5,606	7,419	0	0	0	0	2	0	0	0	0.0	0.0	2	0
NORTH DAKOTA	657	690	0	0	0	0	0	0	0	0	0.0	0.0	0	0
OHIO	10,731	12,031	0	0	0	0	0	0	0	0	0.0	0.0	2	0
OKLAHOMA	2,892	3,702	0	0	0	0	0	0	0	0	0.0	0.0	0	0
OREGON	2,527	3,209	0	0	0	0	0	0	0	0	0.0	0.0	0	0
PENNSYLVANIA	11,731	12,365	0	0	0	0	137	0	1	0	1.1	0.0	42	0
RHODE ISLAND	929	1,033	0	0	0	0	10	0	0	0	1.1	0.0	3	0
SOUTH CAROLINA	2,932	3,700	0	0	0	0	4	0	0	0	0.1	0.0	3	0
SOUTH DAKOTA	689	730	0	0	0	0	0	0	0	0	0.0	0.0	1	0
TENNESSEE	4,380	5,573	0	0	0	0	0	0	0	0	0.0	0.0	0	0
TEXAS	13,385	18,069	0	0	0	0	0	0	0	0	0.0	0.0	0	0
UTAH	1,367	1,688	0	0	0	0	0	0	0	0	0.0	0.0	0	0
VERMONT	493	607	0	0	0	0	19	0	4	0	3.9	0.0	10	0
VIRGINIA	5,197	6,755	0	0	0	0	1	0	0	0	0.0	0.0	2	0
WASHINGTON	3,926	4,859	0	0	0	0	0	0	0	0	0.0	0.0	1	0
WEST VIRGINIA	1,878	2,003	0	0	0	0	100	0	0	0	5.3	0.0	29	0
WISCONSIN	4,720	5,553	0	0	0	0	0	0	0	0	0.0	0.0	0	0
WYOMING	450	484	0	0	0	0	0	0	0	0	0.0	0.0	0	0
AMERICAN SAMOA	31	40	0	0	0	0	0	0	0	0	0.0	0.0	0	0
GUAM	114	275	0	0	0	0	0	0	0	0	0.0	0.0	0	0
N. MARIANAS	17	31	0	0	0	0	0	0	0	0	0.0	0.0	0	0
PUERTO RICO	3,358	4,700	0	0	0	0	86	0	0	0	2.5	0.0	1	0
PAC. TR. TERR.	111	174	0	0	0	0	0	0	0	0	0.0	0.0	0	0
VIRGIN ISLANDS	96	116	0	0	0	0	2	0	0	0	2.3	0.0	1	0
U.S. TOTAL	223,824	272,644	0	0	0	0	2,307	0	432	0	1.0	0.0	272	0

Table 16

Populations Served by Facilities Designed for Less than Secondary Treatment—Present and Projected, Resident and Nonresident

(Population in Thousands)

Table 16 summarizes 1980 populations served by facilities that treat the collected wastes to a degree less than what is defined as secondary treatment. The treated wastes are discharged to surface waters.

Facilities included in this summary provide primary or advanced primary treatment. Primary treatment facilities generally provide preliminary treatment (comminution, screening, grit removal, etc.) plus primary sedimentation. Chlorination may or may not be a unit process. Advanced primary treatment facilities generally provide some biological treatment, but are at present unable to treat wastewater to the degree necessary to comply with EPA's definition of secondary treatment.

Also summarized, for each State and the nation, is the number of facilities providing less than secondary treatment.

The terms, total population, resident, nonresident, receiving treatment, not receiving treatment, and percent served are defined in Table 12.

	POPULATION		RECEIVING TREATMENT				NOT RECEIVING TREATMENT				PERCENT SERVED		TREATMENT PLANTS	
STATE	1980 TOTAL	2000 TOTAL	1980 RES.	2000 RES.	1980 NONRES	2000 NONRES	1980 RES.	2000 RES.	1980 NONRES	2000 NONRES	1980	2000	1980	2000
ALABAMA	3,769	4,140	101	0	11	0	4	0	0	0	2.6	0.0	22	0
ALASKA	406	667	130	0	0	0	45	0	0	0	32.2	0.0	6	0
ARIZONA	2,450	4,149	426	0	0	0	4	0	0	0	17.4	0.0	14	0
ARKANSAS	2,180	2,970	502	0	2	0	36	0	0	0	23.0	0.0	174	0
CALIFORNIA	22,696	26,786	9,385	0	537	0	284	0	0	0	41.3	0.0	61	0
COLORADO	2,772	4,371	270	0	1	0	3	0	0	0	9.7	0.0	17	0
CONNECTICUT	3,115	3,741	321	0	1	0	54	0	0	0	10.3	0.0	8	0
DELAWARE	582	841	6	0	16	0	0	0	0	0	1.1	0.0	4	0
DIST. OF COLUM.	656	661	0	0	0	0	0	0	0	0	0.0	0.0	0	0
FLORIDA	8,860	15,049	86	0	22	0	7	0	0	0	0.9	0.0	8	0
GEORGIA	5,118	7,053	138	0	5	0	22	0	0	0	2.7	0.0	42	0
HAWAII	915	1,366	489	0	41	0	74	0	0	0	53.5	0.0	10	0
IDAHO	905	1,183	137	0	3	0	13	0	4	0	15.2	0.0	66	0
ILLINOIS	11,230	12,358	347	0	1	0	3	0	0	0	3.0	0.0	127	0
INDIANA	5,400	6,059	60	0	0	0	0	0	0	0	1.1	0.0	15	0
IOWA	2,903	3,101	882	0	37	0	19	0	0	0	30.3	0.0	359	0
KANSAS	2,369	2,517	900	0	1	0	71	0	1	0	38.0	0.0	208	0
KENTUCKY	3,527	4,224	73	0	0	0	22	0	0	0	2.0	0.0	14	0
LOUISIANA	4,026	4,659	478	0	3	0	49	0	0	0	11.8	0.0	86	0
MAINE	1,097	1,222	89	0	27	0	60	0	0	0	8.1	0.0	14	0
MARYLAND	4,149	5,583	85	0	91	0	14	0	2	0	2.0	0.0	21	0
MASSACHUSETTS	5,769	6,614	2,326	0	41	0	488	0	0	0	40.3	0.0	21	0
MICHIGAN	9,208	10,314	415	0	2	0	78	0	0	0	4.5	0.0	42	0
MINNESOTA	4,060	4,505	172	0	2	0	6	0	0	0	4.2	0.0	124	0
MISSISSIPPI	2,406	2,740	116	0	0	0	32	0	0	0	4.8	0.0	68	0
MISSOURI	4,868	5,225	1,984	0	739	0	57	0	0	0	40.7	0.0	258	0
MONTANA	786	938	85	0	6	0	8	0	0	0	10.8	0.0	29	0
NEBRASKA	1,574	1,734	679	0	1	0	9	0	0	0	43.1	0.0	72	0
NEVADA	702	1,312	20	0	0	0	0	0	0	0	2.9	0.0	5	0
NEW HAMPSHIRE	887	1,306	168	0	19	0	65	0	3	0	18.9	0.0	19	0
NEW JERSEY	7,332	8,747	1,792	0	457	0	126	0	18	0	24.4	0.0	69	0
NEW MEXICO	1,241	1,781	197	0	1	0	9	0	0	0	15.9	0.0	11	0
NEW YORK	17,649	18,922	4,188	0	956	0	262	0	0	0	23.7	0.0	137	0
NORTH CAROLINA	5,606	7,419	260	0	2	0	49	0	0	0	4.6	0.0	32	0
NORTH DAKOTA	657	690	32	0	0	0	0	0	0	0	4.9	0.0	41	0
OHIO	10,731	12,031	954	0	17	0	46	0	0	0	8.8	0.0	88	0
OKLAHOMA	2,892	3,702	493	0	0	0	32	0	0	0	17.0	0.0	223	0
OREGON	2,527	3,209	34	0	0	0	4	0	0	0	1.3	0.0	6	0
PENNSYLVANIA	11,731	12,365	2,724	0	207	0	159	0	0	0	23.2	0.0	55	0
RHODE ISLAND	929	1,033	279	0	39	0	35	0	0	0	30.0	0.0	6	0
SOUTH CAROLINA	2,932	3,700	167	0	2	0	46	0	3	0	5.7	0.0	72	0
SOUTH DAKOTA	689	730	153	0	2	0	0	0	0	0	22.2	0.0	138	0
TENNESSEE	4,380	5,573	100	0	0	0	24	0	0	0	2.3	0.0	29	0
TEXAS	13,385	18,069	347	0	5	0	8	0	0	0	2.5	0.0	67	0
UTAH	1,367	1,688	5	0	2	0	0	0	0	0	0.4	0.0	2	0
VERMONT	493	607	108	0	17	0	30	0	2	0	21.9	0.0	22	0
VIRGINIA	5,197	6,755	955	0	40	0	82	0	0	0	18.3	0.0	122	0
WASHINGTON	3,926	4,859	1,340	0	340	0	154	0	0	0	34.1	0.0	80	0
WEST VIRGINIA	1,878	2,003	236	0	0	0	122	0	0	0	12.6	0.0	48	0
WISCONSIN	4,720	5,553	164	0	27	0	8	0	0	0	3.4	0.0	110	0
WYOMING	450	484	111	0	0	0	0	0	0	0	24.7	0.0	35	0
AMERICAN SAMOA	31	40	1	0	0	0	27	0	0	0	4.5	0.0	2	0
GUAM	114	275	61	0	2	0	13	0	0	0	54.2	0.0	2	0
N. MARIANAS	17	31	1	0	0	0	8	0	0	0	8.1	0.0	2	0
PUERTO RICO	3,358	4,700	1,663	0	0	0	916	0	0	0	49.5	0.0	27	0
PAC. TR. TERR.	111	174	1	0	0	0	1	0	0	0	1.6	0.0	1	0
VIRGIN ISLANDS	96	116	53	0	3	0	8	0	0	0	55.2	0.0	2	0
U.S. TOTAL	223,824	272,644	37,316	0	3,749	0	3,724	0	38	0	16.6	0.0	3,343	0

Table 17

Plant Loadings, Removal Efficiencies and Discharge Rates from Facilities Existing in 1980—Facilities Designed for Less Than Secondary Treatment

(Metric Tons per Day)

Table 17 summarizes the performance of all treatment facilities designed to provide less than secondary treatment. Information is provided for all States and U.S. Territories, with a national total at the bottom of the table.

This table is designed to estimate the quantities of various pollutants accepted by a treatment plant and the quantities of these same pollutants in the effluent. Quantities are given in metric tons per day for all parameters. BOD and Solids are summarized in this table. No information is given for nutrient removal because none is removed by this degree of treatment.

These data are derived from the daily average flow, daily average influent concentrations, and the daily average effluent concentrations. The averages are based on the actual performance of each individual treatment plant for the most recent 12 month period from which information could be obtained. The values calculated for each plant are summed into State and national totals. The main source of information for flow and concentration values was the self-monitoring reports submitted by every facility with a NPDES permit.

Included in this summary are plants designed to provide primary or advanced primary treatment. Excluded are facilities designed to consistently provide secondary or better degrees of treatment, as well as all those with efficiencies less than primary.

All flows are reported in thousands of cubic meters per day.

A similar table for the projected year 2000 plant loadings is not relevant since this treatment and disposal method does not meet the requirements of the Clean Water Act and is planned to be eliminated by that date.

		REMOVAL EFFICIENCIES					
		BODS			SOLIDS		
STATE	ACTUAL FLOW	INFLUENT	EFFLUENT	% REM.	INFLUENT	EFFLUENT	% REM.
ALABAMA	67	10	5	52,1	9	4	56,5
ALASKA	93	14	7	48,7	19	7	62,2
ARIZONA	123	30	8	72,4	30	5	83,3
ARKANSAS	229	59	10	82,5	54	26	52,1
CALIFORNIA	4,120	1,205	634	47,4	1,426	522	63,3
COLORADO	108	28	5	83,2	23	3	86,9
CONNECTICUT	233	35	19	46,9	37	10	71,8
DELAWARE	7	1	0	70,6	2	0	75,4
DIST. OF CULUM.	0	0	0	0,0	0	0	0,0
FLORIDA	42	9	2	72,8	8	2	71,7
GEORGIA	75	14	3	80,7	15	3	77,7
HAWAII	314	67	61	9,0	58	49	15,3
IDAHO	134	31	7	78,3	27	6	78,3
ILLINOIS	185	42	17	59,4	47	31	33,2
INDIANA	32	5	2	58,7	5	2	67,0
IOWA	511	193	53	72,3	183	41	77,7
KANSAS	441	117	30	74,1	122	30	75,5
KENTUCKY	47	12	7	45,0	14	7	53,9
LOUISIANA	202	39	13	67,1	46	13	71,8
MAINE	89	29	17	42,3	29	12	60,0
MARYLAND	148	40	9	80,0	54	11	79,3
MASSACHUSETTS	2,202	348	239	31,4	368	188	49,0
MICHIGAN	275	71	25	64,4	56	21	63,2
MINNESOTA	88	30	6	80,7	24	5	79,0
MISSISSIPPI	87	17	3	79,6	18	7	59,2
MISSOURI	1,334	272	165	39,1	342	121	64,7
MONTANA	49	8	3	68,3	7	2	68,3
NEBRASKA	348	114	67	40,7	117	60	48,7
NEVADA	12	2	1	74,9	2	1	71,7
NEW HAMPSHIRE	138	30	18	39,6	32	11	64,0
NEW JERSEY	1,227	253	176	30,3	198	102	48,3
NEW MEXICO	80	17	8	52,5	15	6	57,8
NEW YORK	3,441	463	227	50,9	440	183	58,5
NORTH CAROLINA	189	53	8	84,6	44	10	76,0
NORTH DAKOTA	9	2	0	89,1	2	0	76,5
OHIO	524	93	37	59,9	101	32	68,0
OKLAHOMA	215	45	8	82,0	47	11	77,5
OREGON	18	3	0	84,1	3	1	75,3
PENNSYLVANIA	2,028	312	147	52,9	428	167	61,0
RHODE ISLAND	267	20	12	40,7	33	13	59,8
SOUTH CAROLINA	109	22	8	61,2	23	8	65,9
SOUTH DAKOTA	59	16	3	79,5	15	4	72,8
TENNESSEE	63	12	5	61,0	14	4	68,6
TEXAS	128	38	6	82,7	30	5	83,4
UTAH	2	0	0	81,9	0	0	77,4
VERMONT	96	18	11	39,8	15	6	58,6
VIRGINIA	475	88	38	56,3	82	26	68,0
WASHINGTON	970	177	102	42,1	197	65	66,8
WEST VIRGINIA	118	33	14	58,7	30	10	67,1
WISCONSIN	88	20	6	68,9	17	5	71,9
WYOMING	65	13	4	66,6	14	4	68,5
AMERICAN SAMOA	1	0	0	3,1	0	0	4,7
GUAM	21	5	5	0,0	5	5	0,0
N. MARIANAS	2	0	0	68,7	0	0	41,6
PUERTO RICO	475	124	52	57,7	105	31	70,2
PAC. TR. TERR.	0	0	0	80,0	0	0	80,0
VIRGIN ISLANDS	11	2	1	13,6	3	2	13,0
U.S. TOTALS	22,448	4,700	2,316	50,7	5,034	1,901	62,2

NOTES: 1. FLOW IN CUBIC METERS X 1000 PER DAY.

2. SHORT TONS = METRYC TONS X 0.9072.

3. SUM OF ENTRIES MAY NOT EQUAL TOTALS DUE TO ROUND-OFFS.

Table 18

Populations Served by Secondary Treatment—Present and Projected, Resident and Nonresident

(Population in Thousands)

Table 18 summarizes the 1980 populations served and the 2000 populations to be served by facilities designed to provide secondary treatment. In general, this type of facility includes some type of preliminary treatment process followed by a biological process—trickling filter, activated sludge, rotating biological contactors, etc.—with no additional processes except disinfection.

The 1980 and 2000 total State population values reported are from estimates obtained from the BEA. The Percent Served is a function of the residents receiving treatment in relation to the total State population estimated by BEA.

The total population within the service area of an authority is the sum of persons Receiving Treatment and Not Receiving Treatment. Those Not Receiving Treatment reside in the service area but do not contribute to the treatment facility because they are not on a sewer system.

Resident populations are permanent residents in the service area of a sewerage authority. Nonresident populations include commuters living in one area and working in another, as well as temporary residents at resort areas and similar locations.

Also summarized for each State and the nation is the number of secondary facilities in operation in 1980 and the number expected to be operational in 2000.

	POPULATION		RECEIVING TREATMENT				NOT RECEIVING TREATMENT				PERCENT SERVED		TREATMENT PLANTS	
STATE	1980 TOTAL	2000 TOTAL	1980 RES.	2000 RES.	1980 NONRES	2000 NONRES	1980 RES.	2000 RES.	1980 NONRES	2000 NONRES	1980	2000	1980	2000
ALABAMA	3,769	4,140	1,462	1,885	84	160	213	38	1	0	38.8	45.5	202	211
ALASKA	406	667	62	623	2	18	18	14	0	0	15.5	93.4	37	122
ARIZONA	2,450	4,149	1,172	3,187	46	50	181	14	8	0	47.8	76.8	37	64
ARKANSAS	2,180	2,970	510	1,095	5	2	24	0	0	0	23.4	36.8	61	146
CALIFORNIA	22,696	26,786	3,750	11,564	187	552	199	5	0	0	16.5	43.1	163	246
COLORADO	2,772	4,371	926	1,732	72	123	8	0	0	0	33.4	39.6	216	234
CONNECTICUT	3,115	3,741	1,438	2,159	12	38	684	397	0	0	46.1	57.7	68	62
DELAWARE	582	881	15	10	25	43	5	0	0	0	2.6	1.2	12	5
DIST. OF COLUM.	656	661	0	0	0	0	0	0	0	0	0.0	0.0	0	0
FLORIDA	8,860	15,049	2,211	4,470	433	591	851	197	0	0	24.9	29.7	103	62
GEORGIA	5,118	7,053	2,174	1,809	102	70	347	88	0	0	42.4	25.6	300	255
HAWAII	915	1,366	66	1,267	45	236	32	0	0	0	7.2	92.7	14	31
IDAHO	905	1,183	230	494	9	55	22	5	0	3	25.4	41.8	43	129
ILLINOIS	11,230	12,358	1,537	626	6	4	17	0	0	0	13.6	5.0	303	437
INDIANA	5,400	6,059	1,193	773	11	28	119	0	3	0	22.1	12.7	178	128
IOWA	2,903	3,101	1,133	1,508	31	43	41	0	0	0	39.0	48.6	299	732
KANSAS	2,369	2,517	846	2,244	11	19	42	0	0	0	35.7	89.1	195	380
KENTUCKY	3,527	4,224	1,275	1,452	40	50	239	93	0	0	36.1	34.3	162	151
LOUISIANA	4,026	4,659	2,142	3,939	65	96	85	0	1	0	53.2	84.5	209	398
MAINE	1,097	1,222	378	87.	55	128	148	176	1	0	34.4	71.7	72	158
MARYLAND	4,149	5,583	474	207	8	323	146	12	0	0	11.4	3.7	67	74
MASSACHUSETTS	5,769	6,614	1,024	4,471	9	155	597	515	33	52	17.7	67.6	71	96
MICHIGAN	9,208	10,314	427	602	4	22	214	35	1	0	4.6	5.8	146	235
MINNESOTA	4,060	4,505	2,486	795	20	17	124	3	0	0	61.2	17.6	341	428
MISSISSIPPI	2,406	2,740	1,244	731	12	7	297	41	1	0	51.7	26.6	234	196
MISSOURI	4,868	5,225	1,320	4,835	126	1,412	85	0	0	0	27.1	92.5	281	650
MONTANA	786	938	379	609	24	33	13	0	0	0	48.3	64.9	96	125
NEBRASKA	1,574	1,734	623	1,746	13	21	27	0	0	0	39.6	100.7	261	266
NEVADA	702	1,312	29	59	4	5	0	0	0	0	4.1	4.5	11	19
NEW HAMPSHIRE	887	1,306	192	762	34	151	108	152	4	12	21.7	58.3	37	88
NEW JERSEY	7,332	8,747	3,115	5,372	323	1,284	594	38	85	60	42.4	61.4	129	78
NEW MEXICO	1,241	1,781	639	1,260	3	9	58	0	0	0	51.4	70.7	35	66
NEW YORK	17,649	18,922	6,489	12,364	1,297	3,151	1,448	459	46	0	36.7	65.3	196	518
NORTH CAROLINA	5,606	7,419	1,175	1,302	166	247	622	327	4	14	20.9	17.5	404	278
NORTH DAKOTA	657	690	395	568	0	0	0	0	0	0	60.2	82.4	218	288
OHIO	10,731	12,031	2,762	1,437	4	1	227	1	0	0	25.7	11.9	281	141
OKLAHOMA	2,892	3,702	824	385	0	0	23	0	0	0	28.5	10.4	52	36
OREGON	2,527	3,209	397	209	16	17	57	0	1	0	15.7	6.5	91	90
PENNSYLVANIA	11,731	12,365	3,169	3,804	118	699	457	63	0	0	27.0	30.7	324	737
RHODE ISLAND	929	1,033	307	718	8	67	178	80	0	0	33.0	69.5	11	19
SOUTH CAROLINA	2,932	3,700	873	2,019	140	391	314	62	0	0	29.8	54.5	150	159
SOUTH DAKOTA	689	730	279	320	7	3	1	0	0	0	40.5	43.9	91	241
TENNESSEE	4,380	5,573	1,411	1,447	29	13	450	37	0	0	32.2	25.9	158	96
TEXAS	13,385	18,069	6,156	8,057	106	269	396	0	0	0	45.9	44.5	821	1,587
UTAH	1,367	1,688	914	0	11	0	7	0	0	0	66.8	0.0	48	0
VERMONT	493	607	100	144	20	29	33	50	3	3	20.3	23.7	45	62
VIRGINIA	5,197	6,755	780	2,086	54	133	109	19	0	0	15.0	30.8	70	196
WASHINGTON	3,926	4,859	569	3,210	43	622	43	27	3	0	14.5	66.0	124	302
WEST VIRGINIA	1,878	2,003	288	1,393	10	13	56	3	0	0	15.3	69.5	60	428
WISCONSIN	4,720	5,553	942	867	26	55	83	13	0	0	19.9	15.6	254	293
WYOMING	450	484	210	429	15	26	0	0	0	0	46.7	88.6	59	103
AMERICAN SAMOA	31	40	0	36	0	1	0	2	0	0	0.0	90.4	0	5
GUAM	114	275	7	203	0	3	1	18	0	0	6.5	73.8	2	3
N. MARIANAS	17	31	0	2	0	0	0	0	0	0	0.0	7.4	0	1
PUERTO RICO	3,358	4,700	94	3,137	0	0	175	745	0	0	2.8	66.7	5	26
PAC. TR. TERR.	111	174	20	75	0	2	36	26	0	0	18.1	43.1	4	18
VIRGIN ISLANDS	96	116	13	106	0	3	10	7	0	0	13.5	91.9	1	8
U.S. TOTAL	223,824	272,644	62,680	107,508	3,872	11,515	10,292	3,780	202	146	28.0	39.4	7,852	11,903

Table 19

Plant Loadings, Removal Efficiencies and Discharge Rates from Facilities Existing in 1980—Facilities Designed to Provide Secondary Treatment

(Metric Tons per Day)

Table 19 summarizes the performance of all treatment facilities designed to provide secondary treatment. Information is provided for all States and U.S. Territories, with a national total at the bottom of the table.

This table is designed to estimate the quantities of various pollutants accepted by a treatment plant and the quantities of these same pollutants in the effluent. Quantities are given in metric tons per day for all parameters. BOD and Solids are summarized in this table. Nutrient removal capabilities are not summarized in this table because, by definition, secondary treatment plants do not have these capabilities.

These data are derived from the daily average flow, daily average influent, and the daily average effluent concentrations. The averages are based on the actual performances of each individual treatment plant during the most recent 12 month period from which information could be obtained. The values calculated for each plant are summed into State and national totals. The main source of information for flow and concentration values was the self-monitoring reports submitted by every facility with an NPDES permit.

Included in this summary are plants designed to provide secondary treatment. Excluded are facilities designed to consistently provide less than or better than secondary treatment.

Table 19 is an extension of Table 18. A summary of the projected year 2000 performance of secondary facilities is given in Table 20.

All flows are reported in thousands of cubic meters per day.

		REMOVAL EFFICIENCIES					
		BOD5			SOLIDS		
STATE	ACTUAL FLOW	INFLUENT	EFFLUENT	% REM.	INFLUENT	EFFLUENT	% REM.
ALABAMA	883	170	24	85.8	195	33	82.9
ALASKA	37	6	1	77.5	7	2	76.8
ARIZONA	570	107	16	84.8	121	24	80.2
ARKANSAS	302	85	11	86.5	109	17	84.7
CALIFORNIA	1,674	492	58	88.1	545	63	88.5
COLORADO	413	97	10	90.0	90	10	88.8
CONNECTICUT	1,058	151	24	83.9	150	25	83.1
DELAWARE	11	4	0	86.1	3	1	79.8
DIST. OF COLUM.	0	0	0	0.0	0	0	0.0
FLORIDA	1,109	201	28	85.9	220	29	86.9
GEORGIA	1,473	282	41	85.4	261	76	70.8
HAWAII	38	10	3	68.7	10	3	65.6
IDAHO	137	32	4	88.8	29	3	88.7
ILLINOIS	1,077	164	21	87.5	203	24	87.9
INDIANA	881	165	17	89.4	174	22	87.3
IOWA	606	188	25	86.5	161	28	82.5
KANSAS	374	78	10	86.9	85	12	86.3
KENTUCKY	768	195	56	71.3	249	51	79.4
LOUISIANA	1,017	196	33	83.2	204	32	84.5
MAINE	314	66	8	87.2	63	8	86.8
MARYLAND	279	65	26	60.0	59	23	60.3
MASSACHUSETTS	746	134	28	79.1	141	29	79.4
MICHIGAN	289	63	11	83.1	62	14	76.7
MINNESOTA	1,320	339	44	87.1	406	45	88.9
MISSISSIPPI	808	152	21	86.5	176	29	83.7
MISSOURI	778	193	22	88.6	196	25	87.3
MONTANA	190	36	5	84.9	30	6	81.6
NEBRASKA	291	81	10	88.1	83	12	85.8
NEVADA	15	3	1	81.1	3	1	77.0
NEW HAMPSHIRE	143	35	4	88.2	28	3	87.6
NEW JERSEY	2,276	531	327	40.7	609	180	70.5
NEW MEXICO	245	50	11	77.2	53	8	83.8
NEW YORK	4,746	619	205	66.9	661	203	69.2
NORTH CAROLINA	811	169	24	86.0	149	27	82.1
NORTH DAKOTA	137	32	2	94.1	30	3	88.8
OHIO	1,662	341	58	82.8	375	63	83.1
OKLAHOMA	339	75	10	86.7	84	12	85.7
OREGON	381	94	14	85.6	94	18	81.0
PENNSYLVANIA	1,665	290	39	86.4	320	41	87.1
RHODE ISLAND	189	48	6	87.3	35	7	80.0
SOUTH CAROLINA	675	197	32	83.9	146	33	77.5
SOUTH DAKOTA	141	37	5	86.7	33	4	87.5
TENNESSEE	1,135	415	48	88.3	402	88	78.1
TEXAS	3,042	617	56	90.9	617	77	87.4
UTAH	628	91	13	86.2	93	14	84.4
VERMONT	57	10	3	70.6	9	3	66.0
VIRGINIA	346	85	9	89.1	78	11	86.2
WASHINGTON	372	91	10	88.9	86	13	84.9
WEST VIRGINIA	159	33	10	71.0	34	7	81.0
WISCONSIN	617	139	20	85.4	125	16	87.2
WYOMING	104	21	4	80.3	22	5	78.2
AMERICAN SAMOA	0	0	0	0.0	0	0	0.0
GUAM	2	0	0	92.5	0	0	96.0
N. MARIANAS	0	0	0	0.0	0	0	0.0
PUERTO RICO	41	12	2	85.9	12	2	87.2
PAC. TR. TERR.	0	0	0	87.2	0	0	82.0
VIRGIN ISLANDS	3	1	0	84.9	1	0	84.9
U.S. TOTALS	37,404	7,810	1,469	81.1	8,129	1,483	81.7

NOTES: 1. FLOW IN CUBIC METERS X 1000 PER DAY.
2. SHORT TONS = METRIC TONS X 0.9072.
3. SUM OF ENTRIES MAY NOY EQUAL TOTALS DUE TO ROUND-OFFS.

Table 20

Plant Loadings, Removal Efficiencies, and Discharge Rates for Facilities Projected for 2000—Facilities Designed to Provide Secondary Treatment

(Metric Tons per Day)

Table 20 summarizes the expected performance, in the year 2000, of all treatment facilities designed to provide secondary treatment. Information is provided for all States and U.S. Territories, with a national total at the bottom of the table.

This table is designed to estimate the quantities of various pollutants that will be received by a treatment plant and the quantities of these same pollutants that will be in the effluent in 2000. Quantities are given in metric tons per day for all parameters. BOD and Solids are summarized in this table. Nutrient removal capabilities are not summarized in this table because, by definition, secondary treatment plants do not have these capabilities.

These data are derived from the daily average flow, daily average influent concentrations, and the daily average effluent concentrations. The averages are based on the predicted year 2000 situation. The values calculated for each plant are summed into State and national totals.

Included in this summary are plants designed to provide secondary treatment. Excluded are facilities designed to consistently provide less than secondary treatment.

Table 20 is an extension of Tables 18 and 19.

All flows are reported in thousands of cubic meters per day.

		REMOVAL EFFICIENCIES BOD5			SOLYDS		
STATE	ACTUAL FLOW	INFLUENT	EFFLUENT	% REM.	INFLUENT	EFFLUENT	% REM.
ALABAMA	1,136	255	34	86.6	262	35	86.6
ALASKA	347	60	10	82.9	70	11	84.8
ARIZONA	1,163	268	35	86.9	261	36	86.0
ARKANSAS	509	121	15	87.3	116	16	85.8
CALIFORNIA	6,157	1,765	183	89.6	1,744	182	89.5
COLORADO	807	198	24	87.7	187	24	87.0
CONNECTICUT	1,697	325	49	84.9	334	48	85.4
DELAWARE	13	3	0	87.8	3	0	87.8
DIST. OF COLUM.	0	0	0	0.0	0	0	0.0
FLORIDA	2,607	553	78	85.8	599	78	86.9
GEORGIA	1,229	277	37	86.7	242	39	84.0
HAWAII	705	184	21	88.5	149	21	85.7
IDAHO	311	76	9	87.6	70	10	86.3
ILLINOIS	299	60	9	85.3	71	9	87.6
INDIANA	606	124	18	85.3	131	18	86.0
IOWA	879	251	26	89.4	227	34	85.1
KANSAS	1,228	304	37	87.8	335	40	87.9
KENTUCKY	959	203	29	85.8	208	29	86.1
LOUISIANA	2,101	474	63	86.7	487	67	86.2
MAINE	622	149	18	87.7	148	18	87.5
MARYLAND	247	58	7	87.3	58	9	85.2
MASSACHUSETTS	3,847	779	114	85.3	872	114	86.8
MICHIGAN	347	71	10	85.5	71	10	85.5
MINNESOTA	517	139	13	90.7	136	16	88.5
MISSISSIPPI	395	80	12	85.2	82	13	84.4
MISSOURI	3,241	740	97	86.8	773	108	86.0
MONTANA	381	70	11	83.6	74	14	81.7
NEBRASKA	1,022	365	31	91.5	360	34	90.5
NEVADA	29	6	1	85.3	6	1	81.0
NEW HAMPSHIRE	688	211	21	90.2	184	21	88.8
NEW JERSEY	4,006	1,260	118	90.6	1,282	118	90.7
NEW MEXICO	525	111	16	85.8	111	16	85.6
NEW YORK	9,593	1,735	284	83.6	1,898	284	85.0
NORTH CAROLINA	968	251	29	88.5	231	29	87.2
NORTH DAKOTA	212	54	5	90.2	54	6	88.2
OHIO	895	248	26	89.5	280	28	90.0
OKLAHOMA	186	42	6	86.8	43	6	86.4
OREGON	274	85	8	90.3	85	12	85.3
PENNSYLVANIA	2,334	471	70	85.1	504	69	86.2
RHODE ISLAND	649	163	19	88.0	143	19	86.3
SOUTH CAROLINA	1,263	325	38	88.3	282	38	86.5
SOUTH DAKOTA	125	31	4	87.9	30	4	87.1
TENNESSEF	1,193	424	36	91.5	393	36	90.7
TEXAS	3,774	805	79	90.1	805	90	88.8
UTAH	0	0	0	0.0	0	0	0.0
VERMONT	105	22	3	85.3	21	3	85.2
VIRGINIA	1,297	288	39	86.4	289	39	86.5
WASHINGTON	2,133	493	64	87.0	501	66	86.9
WEST VIRGINIA	721	147	22	85.3	148	22	85.4
WISCONSIN	541	123	16	86.7	141	16	88.7
WYOMING	197	42	6	85.9	42	7	84.1
AMERICAN SAMOA	24	8	1	90.7	4	1	80.3
GUAM	82	17	2	85.1	19	2	86.8
N. MARIANAS	1	0	0	85.7	0	0	85.7
PUERTO RICO	1,306	363	39	89.2	328	39	88.0
PAC. TR. TERR.	27	7	1	87.3	7	1	87.3
VIRGIN ISLANDS	43	10	1	87.3	12	1	88.7
U.S. TOTALS	66,593	15,701	1,946	87.6	15,909	2,007	87.3

NOTES: 1. FLOW IN CUBIC METERS X 1000 PER DAY.
2. SHORT TONS = METRYC TONS X 0.9072.
3. SUM OF ENTRIES MAY NOY EQUAL TOTALS DUE TO ROUND-OFFS.

Table 21

Number of Plants Projected for Secondary Treatment by Year 2000—by Total Projected Design Flow

Table 21 is a flow summary for all secondary treatment plants projected to be in operation by the year 2000. In general, this type of treatment plant includes some type of preliminary treatment process followed by a biological process—trickling filter, activated sludge, rotating biological contactors, etc.—with no additional processes except disinfection. A summary is provided for each State and U.S. Territory. National totals are summarized at the bottom of the table.

In the first column the total number of projected secondary treatment plants in each State is reported along with the total wastewater treatment capacity represented by those plants. The Projected Design Flow for each plant was used to calculate the total treatment capacity value. The total State flows are reported in thousands of cubic meters per day.

Subsequent columns provide a breakdown of the State totals into seven flow ranges. The ranges are specified in the column headings and are reported in thousands of cubic meters per day and, in parentheses beneath that heading, in million gallons per day. Reported for each flow range are the number of plants in the range and the percentage of the total State secondary treatment capacity that is accounted for by each flow range.

Included in this summary are all secondary plants in operation in 1980 which will not be abandoned or upgraded between 1980 and 2000, primary and advanced primary plants which will be upgraded to secondary before 2000, and new secondary plants which will be constructed prior to 2000.

			PLANTS AND PERCENT OF FLOW BY FLOW RANGE													
			0-.4 (0-.10)		.401-1.9 (.11-.50)		1.901-4 (.51-1.05)		4.001-19 (1.06-5.01)		19.001-40 (5.02-10.56)		40.001-190 (10.57-50.19)		190.001+ (50.2+)	
STATE	TOTAL PLANTS	TOTAL DESIGN FLOW	PLANTS	% FLOW	PLANTS	% FLOW	PLANTS	% FLOW	PLANTS	% FLOW	PLANTS	% FLOW	PLANTS	% FLOW	PLANTS	% FLOW
ALABAMA	211	1,136	50	1.0	93	7.6	29	7.7	28	23.9	3	7.3	8	52.1	0	0.0
ALASKA	122	347	91	2.4	11	2.7	6	4.8	11	25.2	2	19.6	1	45.0	0	0.0
ARIZONA	64	1,163	9	0.1	27	2.1	9	2.2	10	7.2	3	6.2	5	42.8	1	39.0
ARKANSAS	146	509	71	2.4	44	7.5	13	6.6	11	16.8	4	22.7	3	43.7	0	0.0
CALIFORNIA	246	6,157	59	0.1	68	1.0	26	1.2	49	7.3	17	7.8	20	22.8	7	59.5
COLORADO	234	807	85	2.2	85	9.8	32	11.2	24	23.6	4	14.9	4	37.9	0	0.0
CONNECTICUT	62	1,697	1	0.0	6	0.4	5	0.9	27	15.9	13	25.3	9	43.9	1	13.3
DELAWARE	5	13	4	7.4	0	0.0	0	0.0	1	92.5	0	0.0	0	0.0	0	0.0
DIST. OF COLUM.	0	0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
FLORIDA	62	2,607	7	0.0	20	0.6	4	0.4	14	6.1	5	5.1	7	16.9	5	70.5
GEORGIA	255	1,229	74	1.4	112	8.9	32	7.5	29	22.3	2	3.8	5	38.9	1	16.9
HAWAII	31	705	2	0.0	5	0.9	6	2.1	12	17.4	2	9.6	3	25.6	1	43.9
IDAHO	129	311	59	4.0	44	13.6	11	10.7	13	41.1	1	9.7	1	20.6	0	0.0
ILLINOIS	437	299	238	18.2	182	48.8	12	12.6	4	7.0	1	13.2	0	0.0	0	0.0
INDIANA	128	606	54	1.7	48	7.2	7	3.3	12	17.1	1	5.6	6	64.9	0	0.0
IOWA	732	879	521	10.0	172	16.1	18	4.4	15	11.8	5	15.7	5	41.8	0	0.0
KANSAS	380	1,228	168	2.6	139	10.2	26	5.5	34	25.1	10	24.7	2	15.7	1	16.0
KENTUCKY	151	959	64	1.4	58	5.2	9	2.8	11	9.5	3	8.9	5	30.5	1	41.4
LOUISIANA	398	2,101	146	1.3	138	6.1	42	5.7	55	23.5	8	9.3	7	22.4	2	31.4
MAINE	158	622	47	1.7	56	8.5	17	7.2	32	40.7	2	9.2	4	32.4	0	0.0
MARYLAND	74	247	41	2.6	23	7.1	3	3.3	5	18.3	0	0.0	2	68.4	0	0.0
MASSACHUSETTS	96	3,847	9	0.0	20	0.6	15	1.2	34	8.9	6	4.3	8	21.2	4	63.5
MICHIGAN	235	347	94	6.5	117	27.8	11	9.2	11	19.8	1	10.4	1	26.1	0	0.0
MINNESOTA	428	517	276	9.2	112	19.5	22	11.4	12	17.5	4	21.5	2	20.6	0	0.0
MISSISSIPPI	196	395	91	4.1	65	14.1	21	13.9	15	28.2	3	20.3	1	19.1	0	0.0
MISSOURI	650	3,241	350	1.8	170	5.0	61	5.3	51	13.5	6	5.1	9	29.1	3	39.9
MONTANA	125	381	56	2.6	44	11.0	12	8.4	8	14.2	3	21.8	2	41.7	0	0.0
NEBRASKA	266	1,022	139	2.5	84	6.8	17	4.6	19	15.4	3	9.6	3	35.0	1	25.9
NEVADA	19	29	8	7.6	8	28.7	0	0.0	3	63.6	0	0.0	0	0.0	0	0.0
NEW HAMPSHIRE	88	688	17	0.5	36	5.3	9	3.5	20	26.8	2	9.1	3	25.9	1	28.5
NEW JERSEY	78	4,006	1	0.0	11	0.2	6	0.4	29	7.2	10	7.4	18	37.3	3	47.2
NEW MEXICO	66	525	31	0.9	14	2.7	5	2.9	11	16.5	4	21.6	0	0.0	1	55.1
NEW YORK	518	9,593	174	0.3	188	1.7	55	1.6	51	4.9	20	5.8	15	11.5	15	73.8
NORTH CAROLINA	278	968	135	1.7	76	7.5	26	7.6	29	28.8	8	23.7	4	30.4	0	0.0
NORTH DAKOTA	288	212	230	13.3	44	14.1	4	5.2	7	27.6	3	39.5	0	0.0	0	0.0
OHIO	141	895	47	1.1	57	6.4	13	4.0	18	18.2	3	8.4	2	10.9	1	50.7
OKLAHOMA	36	186	13	1.3	16	7.3	3	4.8	2	8.1	1	14.2	1	64.0	0	0.0
OREGON	90	274	44	3.3	30	10.1	8	8.2	7	23.1	0	0.0	1	55.1	0	0.0
PENNSYLVANIA	737	2,334	329	2.8	247	9.5	73	8.8	76	27.1	8	8.8	3	10.2	1	32.4
RHODE ISLAND	19	649	3	0.0	3	0.5	1	0.4	7	11.8	1	6.0	3	34.4	1	46.6
SOUTH CAROLINA	159	1,263	22	0.3	56	4.3	22	4.8	42	27.8	11	26.4	6	36.1	0	0.0
SOUTH DAKOTA	241	125	181	21.8	53	33.4	2	3.5	5	41.1	0	0.0	0	0.0	0	0.0
TENNESSEE	96	1,193	22	0.4	40	3.2	11	2.8	16	10.8	4	10.0	1	4.4	2	68.1
TEXAS	1,587	3,774	915	3.7	306	9.7	124	9.2	123	28.2	24	17.4	15	31.4	0	0.0
UTAH	0	0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
VERMONT	62	105	27	6.0	22	19.6	6	15.0	7	59.2	0	0.0	0	0.0	0	0.0
VIRGINIA	196	1,297	70	1.1	82	6.2	14	3.2	17	9.4	3	5.5	10	74.3	0	0.0
WASHINGTON	302	2,133	91	1.0	111	4.8	35	4.3	48	23.7	9	11.6	7	23.2	1	31.0
WEST VIRGINIA	428	721	165	4.9	195	26.3	46	17.7	17	14.1	3	11.1	2	25.7	0	0.0
WISCONSIN	293	541	161	5.2	91	16.0	15	6.8	22	35.3	2	13.0	2	23.3	0	0.0
WYOMING	103	197	60	3.5	23	11.1	8	10.7	11	62.5	1	11.9	0	0.0	0	0.0
AMERICAN SAMOA	5	28	2	1.9	2	3.9	0	0.0	0	0.0	1	94.0	0	0.0	0	0.0
GUAM	3	82	0	0.0	0	0.0	0	0.0	1	4.9	1	40.0	1	55.0	0	0.0
N. MARIANAS	1	1	0	0.0	1	99.9	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
PUERTO RICO	26	1,306	0	0.0	1	0.0	5	1.1	6	3.2	4	9.4	9	65.2	1	20.8
PAC. TR. TERR.	18	27	4	3.5	10	24.0	3	38.5	1	33.9	0	0.0	0	0.0	0	0.0
VIRGIN ISLANDS	4	43	0	0.0	1	2.0	0	0.0	2	47.9	1	50.0	0	0.0	0	0.0
U.S. TOTALS	11,903	66,593	5,558	1.5	3,747	5.1	956	4.0	1,125	14.9	236	10.1	226	27.0	55	37.0

NOTES: 1. FLOW RANGE VALUES IN CUBIC METERS PER DAY X 1000. (APPROXIMATE MGD IN PARENTHESES).

2. TOTAL STATE FLOW IN CUBIC METERS PER DAY X 1000.

Table 22

Number of New Secondary Treatment Plants to be Built Between 1980 and 2000—by Total Projected Design Flow

Table 22 is a flow summary for all new secondary treatment plants which will be constructed between 1980 and 2000. In general, this type of treatment plant includes some type of preliminary treatment process followed by a biological process—trickling filter, activated sludge, rotating biological contactors, etc.—with no additional processes except disinfection. A summary is provided for each State and U.S. Territory. National totals are summarized at the bottom of the table.

In the first column the total number of new secondary treatment plants to be constructed in each State is reported along with the total wastewater treatment capacity represented by the plants. The Projected Design Flow for each plant was used to calculate the total treatment capacity value. The total State flows are reported in thousands of cubic meters per day.

Subsequent columns provide a breakdown of the State totals into seven flow ranges. The ranges are specified in the column headings and are reported in thousands of cubic meters per day and, in parentheses beneath that, as million gallons per day. Reported for each flow range are the number of plants in the range and the percentage of the State secondary capacity that is accounted for by each flow range.

Included in this summary are entirely new secondary plants which are planned to be constructed by the year 2000. Excluded are secondary plants that were operational in 1980, primary plants planned to be upgraded to secondary treatment, and advanced primary plants planned to be upgraded to secondary treatment.

			PLANTS AND PERCENT OF FLOW BY FLOW RANGE													
			0-.4 (0-.10)		.401-1.9 (.11-.50)		1.901-4 (.51-1.05)		4.001-19 (1.06-5.01)		19.001-40 (5.02-10.56)		40.001-190 (10.57-50.19)		190.001+ (50.2+)	
STATE	TOTAL PLANTS	TOTAL DESIGN FLOW	PLANTS	% FLOW	PLANTS	% FLOW	PLANTS	- FLOW	PLANTS	% FLOW	PLANTS	% FLOW	PLANTS	% FLOW	PLANTS	% FLOW
ALABAMA	96	131	41	7.8	41	22.7	7	15.4	7	54.0	0	0.0	0	0.0	0	0.0
ALASKA	79	82	67	6.0	5	4.5	1	2.5	5	41.1	1	45.7	0	0.0	0	0.0
ARIZONA	28	80	6	1.7	15	16.9	2	7.0	4	50.1	1	24.0	0	0.0	0	0.0
ARKANSAS	55	74	49	9.1	4	5.0	1	4.0	0	0.0	0	0.0	1	81.7	0	0.0
CALIFORNIA	76	706	42	1.1	23	2.5	4	1.4	4	3.2	1	5.2	1	11.2	1	74.9
COLORADO	28	95	20	3.0	3	1.8	2	4.4	1	5.2	1	35.7	1	49.7	0	0.0
CONNECTICUT	7	60	0	0.0	2	3.0	1	6.5	3	40.0	1	50.2	0	0.0	0	0.0
DELAWARE	4	13	3	6.6	0	0.0	0	0.0	1	93.3	0	0.0	0	0.0	0	0.0
DIST. OF COLUM.	0	0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
FLORIDA	32	586	6	0.2	16	2.1	0	0.0	6	11.5	2	8.5	1	9.6	1	67.8
GEORGIA	77	60	43	16.9	27	33.8	5	21.1	2	27.9	0	0.0	0	0.0	0	0.0
HAWAII	17	171	2	0.3	3	2.4	4	6.1	7	35.8	0	0.0	1	55.2	0	0.0
IDAHO	32	20	22	16.9	8	37.4	1	14.4	1	31.2	0	0.0	0	0.0	0	0.0
ILLINOIS	139	36	117	60.6	22	39.3	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
INDIANA	49	76	40	8.3	3	7.2	0	0.0	0	0.0	0	0.0	1	84.4	0	0.0
IOWA	211	38	206	59.1	3	6.3	0	0.0	2	34.5	0	0.0	0	0.0	0	0.0
KANSAS	20	110	14	1.6	3	1.8	0	0.0	1	15.4	1	29.5	1	51.4	0	0.0
KENTUCKY	82	102	56	11.3	23	16.6	1	2.2	0	0.0	1	25.2	1	48.5	0	0.0
LOUISIANA	178	465	110	4.4	45	7.9	10	5.4	10	20.6	1	4.2	1	14.5	1	42.6
MAINE	80	72	40	12.7	32	38.0	4	16.8	4	32.3	0	0.0	0	0.0	0	0.0
MARYLAND	41	37	33	13.4	5	7.7	1	7.3	2	71.5	0	0.0	0	0.0	0	0.0
MASSACHUSETTS	27	103	7	1.0	9	8.1	3	9.3	7	54.9	1	26.3	0	0.0	0	0.0
MICHIGAN	120	64	65	22.8	51	62.1	4	14.9	0	0.0	0	0.0	0	0.0	0	0.0
MINNESOTA	97	21	88	48.2	6	23.6	3	28.1	0	0.0	0	0.0	0	0.0	0	0.0
MISSISSIPPI	82	57	62	16.5	16	19.2	1	6.7	2	20.9	1	36.4	0	0.0	0	0.0
MISSOURI	242	483	207	5.6	19	2.9	4	1.8	8	11.6	1	5.1	3	72.7	0	0.0
MONTANA	5	0	5	99.9	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
NEBRASKA	1	0	1	99.9	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
NEVADA	9	4	5	27.2	4	72.7	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
NEW HAMPSHIRE	43	135	12	2.0	23	16.4	3	6.2	3	13.1	1	28.2	1	33.9	0	0.0
NEW JERSEY	10	40	0	0.0	4	10.8	1	7.4	5	81.6	0	0.0	0	0.0	0	0.0
NEW MEXICO	30	10	25	35.4	3	17.5	2	47.0	0	0.0	0	0.0	0	0.0	0	0.0
NEW YORK	324	1,507	159	2.2	126	6.6	17	3.2	10	5.1	6	10.5	4	14.5	2	57.7
NORTH CAROLINA	103	197	75	4.6	17	6.8	3	4.2	6	23.9	0	0.0	2	60.3	0	0.0
NORTH DAKOTA	33	1	33	99.9	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
OHIO	40	58	29	10.0	9	10.3	0	0.0	1	9.7	0	0.0	1	69.8	0	0.0
OKLAHOMA	5	0	5	99.9	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
OREGON	22	4	20	72.2	2	27.7	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
PENNSYLVANIA	526	493	297	12.1	173	28.9	30	16.1	25	38.7	1	4.0	0	0.0	0	0.0
RHODE ISLAND	6	18	3	3.2	0	0.0	1	14.9	2	81.7	0	0.0	0	0.0	0	0.0
SOUTH CAROLINA	47	178	16	1.7	20	11.0	3	4.5	5	27.6	3	55.0	0	0.0	0	0.0
SOUTH DAKOTA	32	4	29	45.5	3	54.4	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
TENNESSEE	36	88	15	3.9	16	16.7	2	6.4	2	12.8	0	0.0	1	59.9	0	0.0
TEXAS	851	388	736	26.3	91	18.8	11	7.4	10	20.8	2	12.4	1	14.0	0	0.0
UTAH	0	0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
VERMONT	22	11	14	28.3	8	71.6	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
VIRGINIA	94	376	45	2.4	36	8.9	4	2.9	8	9.2	2	11.2	3	65.0	0	0.0
WASHINGTON	110	154	59	8.2	40	23.1	5	6.9	5	32.2	0	0.0	1	29.3	0	0.0
WEST VIRGINIA	346	327	151	9.7	156	44.7	32	27.1	6	11.3	1	6.9	0	0.0	0	0.0
WISCONSIN	87	30	71	29.1	14	43.5	1	9.9	1	17.3	0	0.0	0	0.0	0	0.0
WYOMING	17	12	16	9.7	0	0.0	0	0.0	1	90.2	0	0.0	0	0.0	0	0.0
AMERICAN SAMOA	4	1	2	33.3	2	66.6	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
GUAM	0	0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
N. MARIANAS	1	1	0	0.0	1	99.9	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
PUERTO RICO	2	41	0	0.0	0	0.0	1	9.0	0	0.0	1	90.9	0	0.0	0	0.0
PAC. TR. TERR.	13	9	4	10.6	8	47.9	1	41.3	0	0.0	0	0.0	0	0.0	0	0.0
VIRGIN ISLANDS	1	0	0	0.0	1	100.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
U.S. TOTALS	4,719	7,852	3,173	6.5	1.146	12.1	176	6.0	163	16.9	30	10.5	26	22.2	5	25.4

NOTES: 1. FLOW RANGE VALUES IN CUBIC METERS PER DAY X 1000. (APPROXIMATE MGD IN PARENTHESES).

2. TOTAL STATE FLOW IN CUBIC METERS PER DAY X 1000.

Table 23

Dollar Needs for Construction of New Secondary Treatment Facilities by Plant Size

(Thousands of 1980 Dollars)

Table 23 summarizes the projected cost, reported as January 1980 dollars, for the construction of new secondary treatment plants to be built between 1980 and 2000. Table 23 is a direct extension of Table 22.

The summary indicates a total dollar need per State for new secondary facilities. The State totals are broken down into dollar needs by flow range. An individual plant's dollar need is included in the total for the flow range of that plant's projected design capacity.

CUBIC METERS PER DAY X 1000 (MILLION GALLONS PER DAY)			TOTAL PROJECTED DESIGN FLOW 0-.40 (0-.10)	.401-1.9 (.11-.50)	1.901-4.0 (.51-1.05)	4.001-19 (1.06-5.01)	19.001-40 (5.02-10.56)	40.001-190 (10.57-50.19)	190.001+ (50.2+)
STATE	# OF PLANTS	STATE NEEDS	NEEDS	NEEDS	NEEDS	NEEDS	NEEDS	NEEDS	NEEDS
ALABAMA	96	74,808	8,993	18,563	11,132	36,120	0	0	0
ALASKA	79	76,842	19,019	7,846	0	33,526	16,451	0	0
ARIZONA	28	47,546	1,404	11,304	4,411	21,621	8,806	0	0
ARKANSAS	55	18,264	6,065	2,351	1,395	0	0	8,453	0
CALIFORNIA	76	409,600	13,261	21,419	10,211	13,839	5,628	134,994	210,248
COLORADO	28	69,920	2,672	1,461	3,147	3,296	13,096	46,248	0
CONNECTICUT	7	45,591	0	2,166	3,482	21,692	18,251	0	0
DELAWARE	4	8,880	870	0	0	8,010	0	0	0
DIST. OF COLUM.	0	0	0	0	0	0	0	0	0
FLORIDA	32	191,034	1,140	10,505	0	41,029	39,703	47,335	51,322
GEORGIA	77	38,215	8,793	13,877	7,778	7,767	0	0	0
HAWAII	17	94,884	1,310	8,406	16,429	53,196	0	15,543	0
IDAHO	32	21,662	6,110	12,040	2,286	1,226	0	0	0
ILLINOIS	139	52,625	37,583	15,042	0	0	0	0	0
INDIANA	49	36,720	12,445	6,360	0	0	0	17,915	0
IOWA	211	45,165	39,771	1,989	0	3,405	0	0	0
KANSAS	20	57,025	2,233	2,831	0	8,610	13,275	30,076	0
KENTUCKY	82	51,592	11,490	12,499	804	0	6,634	20,165	0
LOUISIANA	178	225,286	18,483	23,237	16,866	44,692	9,232	21,519	91,257
MAINE	80	59,202	16,359	33,204	5,924	3,715	0	0	0
MARYLAND	41	14,069	5,588	3,517	1,676	3,288	0	0	0
MASSACHUSETTS	27	77,126	2,838	7,645	8,331	47,733	10,579	0	0
MICHIGAN	120	79,743	23,754	49,009	6,980	0	0	0	0
MINNESOTA	97	32,710	21,348	4,844	6,518	0	0	0	0
MISSISSIPPI	82	26,509	8,597	6,920	716	3,095	7,181	0	0
MISSOURI	242	261,051	29,717	10,923	4,228	22,943	11,346	181,894	0
MONTANA	5	712	712	0	0	0	0	0	0
NEBRASKA	1	55	55	0	0	0	0	0	0
NEVADA	9	5,321	1,508	3,813	0	0	0	0	0
NEW HAMPSHIRE	43	54,769	4,663	25,722	7,316	13,761	0	3,307	0
NEW JERSEY	10	35,712	0	5,403	3,310	26,999	0	0	0
NEW MEXICO	30	8,679	3,604	1,523	3,552	0	0	0	0
NEW YORK	324	1,212,345	43,074	101,916	33,037	57,480	64,041	122,011	790,786
NORTH CAROLINA	103	89,265	10,363	13,284	5,110	19,106	0	41,402	0
NORTH DAKOTA	33	1,900	1,900	0	0	0	0	0	0
OHIO	40	36,882	9,381	8,094	0	3,027	0	16,380	0
OKLAHOMA	5	593	593	0	0	0	0	0	0
OREGON	22	6,737	5,468	1,269	0	0	0	0	0
PENNSYLVANIA	526	410,100	69,034	144,691	76,739	112,673	6,963	0	0
RHODE ISLAND	6	11,549	1,272	0	0	10,277	0	0	0
SOUTH CAROLINA	47	78,662	3,522	13,671	6,251	14,806	40,412	0	0
SOUTH DAKOTA	32	5,089	3,322	1,767	0	0	0	0	0
TENNESSEE	36	46,732	5,076	14,086	3,529	6,717	0	17,324	0
TEXAS	851	270,017	119,672	60,611	18,268	35,933	18,243	17,290	0
UTAH	0	0	0	0	0	0	0	0	0
VERMONT	22	9,162	4,143	5,019	0	0	0	0	0
VIRGINIA	98	134,951	11,548	29,771	5,375	13,979	21,590	52,688	0
WASHINGTON	110	99,443	15,719	40,084	12,337	20,058	0	11,245	0
WEST VIRGINIA	366	223,180	36,652	109,943	55,806	20,779	0	0	0
WISCONSIN	87	34,122	15,060	13,202	2,032	3,828	0	0	0
WYOMING	17	4,134	1,476	0	0	2,658	0	0	0
AMERICAN SAMOA	4	2,942	1,123	1,819	0	0	0	0	0
GUAM	0	0	0	0	0	0	0	0	0
N. MARIANAS	1	2,753	0	2,753	0	0	0	0	0
PUERTO RICO	2	2,634	0	0	2,634	0	0	0	0
PAC. TR. TERR.	13	15,252	2,267	8,903	4,082	0	0	0	0
VIRGIN ISLANDS	1	992	0	992	0	0	0	0	0
U.S. TOTALS	4,719	4,940,753	691,050	896,254	351,732	740,884	311,431	805,789	1,143,613

Table 24

Number of Facilities and Reasons for Treatment More Stringent than Secondary

(Facilities in the Year 2000)

Table 24 is a summary of the numbers of treatment facilities required to have treatment levels more stringent than secondary treatment. This summary includes all those plants existent in 1980 treating wastes to these levels plus those required to be constructed or upgraded to this level between 1980 and 2000.

The first column lists, by State, the total number of treatment plants that will be operational in 2000. The second column lists the number of plants that will have to provide treatment more stringent than secondary. The remaining columns describe the reasons these plants must provide treatment more stringent than secondary. The headings for these remaining columns are self-explanatory.

It is to be noted that more than one reason is possible for any single treatment plant being required to provide treatment more stringent than secondary. Therefore, the number of reasons does not equal the number of more stringent plants for all States.

			REASONS FOR TREATMENT LEVEL BEING MORE STRINGENT THAN SECONDARY							
STATE	TOTAL NUMBER OF TREATMENT FACILITIES	NUMBER REQUIRING MORE STRINGENT TREATMENT	EPA-APPROVED WATER QUALITY PLAN	STATE COURT ORDER	FEDERAL COURT ORDER	DISCHARGE PERMIT CONDITIONS	STATE OR FEDERAL ENFORCEMENT ORDER	VOLUNTARY COMPLIANCE	STATE CERTIFICATE	OTHER
ALABAMA	341	130	6	0	0	72	0	0	64	0
ALASKA	125	3	1	0	0	2	0	0	0	0
ARIZONA	152	4	1	0	0	3	0	0	0	0
ARKANSAS	623	470	5	0	0	54	1	1	419	0
CALIFORNIA	946	79	2	0	0	73	2	1	5	0
COLORADO	297	37	22	0	0	11	0	0	5	0
CONNECTICUT	89	26	6	1	0	11	1	0	7	0
DELAWARE	23	18	15	0	0	15	0	0	1	0
DIST. OF COLUM.	1	1	0	0	0	1	0	0	0	0
FLORIDA	326	239	23	0	0	80	0	0	141	22
GEORGIA	436	180	31	0	0	99	1	1	105	0
HAWAII	40	2	1	0	0	1	0	0	0	0
IDAHO	199	12	3	0	0	6	0	0	3	1
ILLINOIS	846	404	2	6	3	359	0	0	159	2
INDIANA	586	458	71	0	1	294	72	0	32	3
IOWA	846	111	7	0	0	21	1	0	86	1
KANSAS	607	6	0	0	0	2	0	0	4	0
KENTUCKY	399	248	18	1	0	100	0	0	188	0
LOUISIANA	447	39	1	0	0	12	0	0	31	0
MAINE	204	15	0	1	0	1	0	0	13	0
MARYLAND	347	272	249	0	0	103	1	0	6	0
MASSACHUSETTS	137	39	18	0	0	16	2	0	11	0
MICHIGAN	513	203	27	11	0	167	10	1	24	0
MINNESOTA	585	144	36	1	0	154	0	0	9	0
MISSISSIPPI	520	324	4	2	0	85	1	0	251	3
MISSOURI	696	30	0	0	0	8	1	0	21	0
MONTANA	176	4	0	0	0	1	0	1	2	0
NEBRASKA	464	0	0	0	0	0	0	0	0	0
NEVADA	73	8	2	0	0	6	0	0	1	0
NEW HAMPSHIRE	143	15	1	0	0	5	0	0	9	0
NEW JERSEY	162	84	1	13	19	6	33	1	14	1
NEW MEXICO	172	11	0	0	0	4	0	0	8	0
NEW YORK	828	305	8	5	5	20	24	5	238	1
NORTH CAROLINA	656	375	36	29	0	120	0	0	276	2
NORTH DAKOTA	312	0	0	0	0	0	0	0	0	0
OHIO	795	653	169	12	1	485	4	0	37	1
OKLAHOMA	664	341	74	0	0	179	0	0	91	0
OREGON	236	129	114	0	0	83	0	0	0	0
PENNSYLVANIA	1,262	525	127	55	10	312	30	0	106	1
RHODE ISLAND	26	7	2	0	0	2	0	0	3	0
SOUTH CAROLINA	282	122	21	0	5	44	1	0	73	3
SOUTH DAKOTA	287	18	2	0	0	14	0	0	3	0
TENNESSEE	291	195	20	0	1	126	1	0	79	4
TEXAS	2,176	368	3	0	0	309	0	1	290	2
UTAH	198	176	2	0	0	150	0	0	21	3
VERMONT	103	36	2	0	0	14	0	0	19	1
VIRGINIA	306	109	71	0	1	32	1	0	12	1
WASHINGTON	340	10	2	0	0	7	4	1	0	0
WEST VIRGINIA	534	106	66	0	0	33	2	0	15	0
WISCONSIN	631	264	13	1	0	160	5	2	132	3
WYOMING	119	4	1	0	0	0	0	0	3	0
AMERICAN SAMOA	5	0	0	0	0	0	0	0	0	0
GUAM	6	0	0	0	0	0	0	0	0	0
N. MARIANAS	3	2	0	0	0	0	0	0	2	0
PUERTO RICO	31	5	0	0	0	1	0	2	2	0
PAC. TR. TERR.	23	3	0	0	0	0	0	0	3	0
VIRGIN ISLANDS	4	0	0	0	0	0	0	0	0	0
U.S. TOTALS	21,639	7,369	1,286	138	46	3,863	202	17	3,024	55

Table 25

Populations Served by Advanced Secondary Treatment—Present and Projected, Resident and Nonresident

(Population in Thousands)

Table 25 summarizes the 1980 populations served and the 2000 populations to be served by facilities designed to provide advanced secondary treatment. The treatment levels attained by advanced secondary plants are defined in terms of the effluent BOD concentration and/or the removal of nutrients, phosphorus (as PO_4), and/or ammonia (NH_3). A plant is considered to be advanced secondary in design if it is capable of consistently provuding an effluent with a BOD concentration in the range of 24 to 10 mg/l; and/or, it has specific processes which remove phosphorus and/or ammonia in excess of the amounts normally removed by secondary treatment.

The 1980 and 2000 total State population values reported are from estimates obtained from the BEA. The percent served is a function of the residents receiving treatment in relation to the total State population estimated by BEA.

The total population within the service area of an authority is the sum of persons Receiving Treatment and Not Receiving Treatment. Those Not Receiving Treatment reside in the service area but do not contribute to the treatment facility because they are not on a sewer system.

Resident populations are permanent residents in the service area of a sewerage authority. Nonresident populations include commuters living in one area and working in another, as well as temporary residents at resort areas and similar locations.

STATE	POPULATION 1980 TOTAL	 2000 TOTAL	RECEIVING TREATMENT 1980 RES.	 2000 RES.	 1980 NONRES	 2000 NONRES	NOT RECEIVING TREATMENT 1980 RES.	 2000 RES.	 1980 NONRES	 2000 NONRES	PERCENT SERVED 1980	 2000	TREATMENT PLANTS 1980	 2000
ALABAMA	3,769	4,140	438	1,421	7	40	103	7	0	0	11.6	34.3	21	127
ALASKA	406	667	6	26	0	1	0	0	0	0	1.6	4.0	3	3
ARIZONA	2,450	4,149	9	23	2	4	0	1	0	0	0.3	0.5	3	4
ARKANSAS	2,180	2,970	194	1,129	15	38	7	0	0	0	8.9	38.0	44	438
CALIFORNIA	22,696	26,786	3,533	7,497	100	346	180	103	0	0	15.5	27.9	63	66
COLORADO	2,772	4,371	1,243	2,230	82	390	1	0	0	0	44.8	51.0	14	35
CONNECTICUT	3,115	3,741	83	614	16	9	80	93	0	0	2.6	16.4	19	23
DELAWARE	582	881	437	804	39	364	57	17	0	0	75.1	95.6	5	17
DIST. OF COLUM.	656	661	729	0	1,898	0	0	0	0	0	111.2	0.0	1	0
FLORIDA	8,860	15,049	1,694	4,825	278	701	283	94	0	0	19.1	32.0	101	199
GEORGIA	5,118	7,053	689	3,924	24	153	164	144	0	0	13.4	55.6	44	175
HAWAII	915	1,366	28	11	2	4	0	0	0	0	3.1	0.8	6	2
IDAHO	985	1,183	81	271	0	1	16	0	0	0	9.0	22.9	3	6
ILLINOIS	11,230	12,358	7,729	10,931	24	41	77	12	0	0	68.8	88.4	282	391
INDIANA	5,400	6,059	2,045	3,568	231	472	135	23	17	0	37.8	58.8	148	438
IOWA	2,903	3,101	80	1,323	0	103	2	0	0	0	2.7	42.6	9	111
KANSAS	2,369	2,517	0	166	0	0	0	0	0	0	0.0	6.6	2	6
KENTUCKY	3,527	4,224	329	1,878	19	86	69	160	0	0	9.3	44.4	49	245
LOUISIANA	4,026	4,659	110	495	0	6	0	0	0	0	2.7	10.6	10	34
MAINE	1,097	1,222	15	11	0	1	3	4	0	0	1.4	0.9	2	11
MARYLAND	4,149	5,583	1,758	2,731	32	160	172	57	0	0	42.3	48.9	51	260
MASSACHUSETTS	5,769	6,614	346	758	0	42	135	143	2	3	6.0	11.4	13	27
MICHIGAN	9,208	10,314	5,445	7,358	79	157	527	208	0	4	59.1	71.3	119	187
MINNESOTA	4,060	4,505	197	2,519	0	21	5	26	0	0	4.8	55.9	18	98
MISSISSIPPI	2,406	2,740	71	1,664	2	8	7	75	0	0	2.9	60.7	23	321
MISSOURI	4,868	5,225	108	297	12	19	53	0	0	0	2.2	5.6	5	12
MONTANA	786	938	0	89	0	2	0	0	0	0	0.0	9.4	0	6
NEBRASKA	1,574	1,734	0	0	0	0	0	0	0	0	0.0	0.0	0	0
NEVADA	702	1,312	186	307	53	45	2	0	0	0	26.5	23.4	8	4
NEW HAMPSHIRE	887	1,306	1	69	0	0	0	17	0	0	0.1	5.3	1	9
NEW JERSEY	7,332	8,747	698	1,706	23	160	98	13	0	0	9.5	19.5	29	65
NEW MEXICO	1,241	1,781	10	83	12	21	0	34	0	0	0.8	4.7	4	11
NEW YORK	17,649	18,922	1,605	4,233	119	724	398	229	5	0	9.0	22.3	96	212
NORTH CAROLINA	5,606	7,419	594	1,675	2	142	183	290	0	0	10.6	22.5	46	230
NORTH DAKOTA	657	690	0	0	0	0	0	0	0	0	0.0	0.0	0	0
OHIO	10,731	12,031	4,046	6,773	20	45	276	7	0	0	37.7	56.2	304	524
OKLAHOMA	2,892	3,702	725	2,923	0	10	38	6	0	0	25.0	78.9	89	340
OREGON	2,527	3,209	910	2,522	19	50	220	0	0	0	36.0	78.6	97	125
PENNSYLVANIA	11,731	12,365	2,707	7,518	196	540	571	152	5	0	23.0	60.8	229	493
RHODE ISLAND	929	1,033	2	276	0	4	7	46	0	0	0.2	26.7	1	7
SOUTH CAROLINA	2,932	3,700	246	757	89	104	67	40	0	0	8.3	20.4	23	116
SOUTH DAKOTA	689	730	11	301	3	1	0	0	0	0	1.6	41.2	3	17
TENNESSEE	4,380	5,573	629	2,504	37	130	309	202	0	0	14.3	44.9	45	182
TEXAS	13,385	18,069	3,666	5,702	58	138	182	0	0	0	27.3	31.5	192	341
UTAH	1,367	1,688	199	1,601	1	37	0	0	0	0	14.5	94.8	9	176
VERMONT	493	607	16	204	5	38	0	24	0	3	3.3	33.7	5	35
VIRGINIA	5,197	6,755	936	1,529	202	328	134	30	0	0	18.0	22.6	61	81
WASHINGTON	3,926	4,859	436	1,043	50	160	110	70	2	0	11.1	21.4	4	8
WEST VIRGINIA	1,878	2,003	148	464	5	11	35	18	0	0	7.9	23.2	10	92
WISCONSIN	4,720	5,553	2,327	4,279	16	78	67	10	0	0	49.3	77.0	128	261
WYOMING	450	484	0	163	0	0	0	0	0	0	0.0	33.7	0	4
AMERICAN SAMOA	31	40	0	0	0	0	0	0	0	0	0.0	0.0	0	0
GUAM	114	275	0	0	0	0	0	0	0	0	0.0	0.0	0	0
N. MARIANAS	17	31	0	29	0	2	0	0	0	0	0.0	93.5	0	2
PUERTO RICO	3,358	4,700	0	105	0	0	0	26	0	0	0.0	2.2	0	5
PAC. TR. TERR.	111	174	1	28	0	2	8	0	0	0	0.9	16.1	1	3
VIRGIN ISLANDS	96	116	0	0	0	0	0	0	0	0	0.0	0.0	0	0
U.S. TOTAL	223,824	272,644	47,518	103,383	3,790	5,917	4,800	2,398	34	12	21.2	37.9	2,443	6,543

Table 26

Plant Loadings, Removal Efficiencies, and Discharge Rates for Facilities in Operation in 1980—Facilities Designed to Provide Advanced Secondary Treatment

(Metric Tons per Day)

Table 26 summarizes the performance of all treatment facilities designed to provide advanced secondary treatment. Information is provided for all States and U.S. Territories, with a national total at the bottom of the table.

This table is designed to estimate the quantities of various pollutants accepted by a treatment plant and the quantities of these same pollutants in the effluent. Quantities are given in metric tons per day for all parameters. BOD and Solids are summarized in this table. Information is also provided on nutrient removal capabilities.

Plants with Removal Capabilities are facilities with a specific requirement to remove the listed nutrient. For instance, some phosphorus is removed in all treatment plants. However, only plants specifically designed to remove phosphorus are reported in this category. Reported for each nutrient are the total number of plants with removal capabilities and the total average daily flow received by these plants. Also given is the percentage of the total State flow the plants represent.

These data are derived from the daily average flow, daily average influent concentrations, and the daily average effluent concentrations. The averages are based on the actual performance of each individual treatment plant during the most recent 12 month period from which information could be obtained. The values calculated for each plant are summed into State and national totals. The main source of information for flow and concentration values was the self-monitoring reports submitted by every facility with an NPDES permit.

Table 26 is an extension of Table 25. A summary of the projected year 2000 performance of all advanced secondary facilities is given in Table 27.

Total Flow is the sum of the actual average daily flows treated by all facilities within the State designed to provide advanced secondary treatment.

All flows are reported in thousands of cubic meters per day.

		REMOVAL EFFICIENCIES						PLANTS WITH REMOVAL CAPABILITY								
		BODS			SOLIDS			PHOSPHORUS			NH3 NITROGEN			TOTAL N		
STATE	TOTAL FLOW	INF.	EFF.	% REM.	INF.	EFF.	% REM.	# PLANTS	FLOW	% TOT. FLOW	# PLANTS	FLOW	% TOT. FLOW	# PLANTS	FLOW	% TOT. FLOW
ALABAMA	311	32	10	67.7	34	8	74.5	0	0	0.0	14	278	89.4	0	0	0.0
ALASKA	4	0	0	85.0	0	0	85.7	0	0	0.0	0	0	0.0	0	0	0.0
ARIZONA	3	0	0	87.1	0	0	82.7	0	0	0.0	0	0	0.0	0	0	0.0
ARKANSAS	96	21	1	94.6	19	1	91.6	0	0	0.0	0	0	0.0	0	0	0.0
CALIFORNIA	1,775	503	44	91.1	497	38	92.2	5	292	16.4	10	786	44.2	0	0	0.0
COLORADO	640	135	11	91.6	156	11	92.6	4	5	0.8	3	11	1.8	0	0	0.0
CONNECTICUT	56	9	1	87.6	10	1	85.6	0	0	0.0	0	0	0.0	0	0	0.0
DELAWARE	297	51	7	84.9	56	15	73.3	0	0	0.0	0	0	0.0	0	0	0.0
DIST. OF COLUM.	1,128	168	32	80.5	181	33	81.3	1	1,128	100.0	1	1,128	100.0	0	0	0.0
FLORIDA	854	141	11	92.2	138	24	82.2	9	113	13.2	10	113	13.2	0	0	0.0
GEORGIA	367	71	10	84.6	63	10	83.1	12	112	30.5	22	183	49.9	0	0	0.0
HAWAII	8	1	0	93.0	1	0	90.3	0	0	0.0	0	0	0.0	0	0	0.0
IDAHO	52	13	0	93.8	14	1	91.0	0	0	0.0	1	38	74.1	0	0	0.0
ILLINOIS	6,301	867	60	92.9	1,135	66	94.1	26	201	3.1	29	4,591	72.8	0	0	0.0
INDIANA	1,695	280	35	87.4	346	39	88.4	43	847	49.9	9	748	44.1	0	0	0.0
IOWA	44	18	0	97.3	20	0	96.5	0	0	0.0	7	42	96.2	0	0	0.0
KANSAS	0	0	0	93.8	0	0	93.2	0	0	0.0	0	0	0.0	0	0	0.0
KENTUCKY	173	28	2	90.2	26	2	89.4	0	0	0.0	19	136	78.5	0	0	0.0
LOUISIANA	43	9	0	93.6	8	0	90.7	0	0	0.0	0	0	0.0	0	0	0.0
MAINE	14	3	0	91.9	3	0	90.0	1	0	3.1	0	0	0.0	0	0	0.0
MARYLAND	870	214	36	83.0	177	25	85.3	4	677	77.8	3	78	8.9	0	0	0.0
MASSACHUSETTS	247	32	4	85.6	48	4	91.8	2	5	2.3	2	24	9.9	0	0	0.0
MICHIGAN	4,385	1,229	123	89.9	2,316	223	90.3	104	4,312	98.3	15	384	8.7	0	0	0.0
MINNESOTA	146	35	3	91.3	25	3	85.4	14	137	93.6	0	0	0.0	0	0	0.0
MISSISSIPPI	57	10	1	90.5	11	3	68.5	1	0	0.2	14	25	43.9	0	0	0.0
MISSOURI	77	18	0	95.5	16	0	94.9	0	0	0.0	1	66	86.1	0	0	0.0
NEVADA	347	24	3	87.5	28	1	94.1	2	322	92.8	1	68	19.8	0	0	0.0
NEW HAMPSHIRE	0	0	0	89.4	0	0	89.4	0	0	0.0	0	0	0.0	0	0	0.0
NEW JERSEY	368	70	13	80.6	79	12	84.0	2	4	1.0	2	4	1.3	0	0	0.0
NEW MEXICO	7	1	0	86.6	1	0	87.6	1	5	75.0	0	0	0.0	0	0	0.0
NEW YORK	1,085	182	28	84.5	162	26	83.6	17	417	38.4	7	27	2.5	0	0	0.0
NORTH CAROLINA	469	115	12	89.0	71	14	79.5	2	6	1.3	34	256	54.5	0	0	0.0
OHIO	2,872	499	68	86.3	683	102	84.9	42	505	17.5	72	351	12.2	0	0	0.0
OKLAHOMA	343	68	7	89.4	73	8	88.1	4	73	21.3	4	73	21.3	0	0	0.0
OREGON	614	107	8	91.8	116	11	89.8	1	18	2.9	1	19	3.1	0	0	0.0
PENNSYLVANIA	1,627	325	54	83.3	356	92	73.9	69	620	38.1	87	341	20.9	0	0	0.0
RHODE ISLAND	1	0	0	68.4	0	0	76.9	0	0	0.0	0	0	0.0	0	0	0.0
SOUTH CAROLINA	157	39	5	86.3	27	4	82.5	2	5	3.5	19	146	93.0	0	0	0.0
SOUTH DAKOTA	4	0	0	94.1	1	0	95.0	0	0	0.0	1	3	72.0	0	0	0.0
TENNESSEE	494	95	31	67.1	96	24	74.3	0	0	0.0	13	459	93.0	0	0	0.0
TEXAS	2,029	503	56	88.8	539	104	80.6	2	24	1.2	34	65	3.2	0	0	0.0
UTAH	152	18	2	84.8	20	2	88.6	0	0	0.0	0	0	0.0	0	0	0.0
VERMONT	13	1	0	95.9	1	0	94.8	2	1	8.1	1	9	75.5	0	0	0.0
VIRGINIA	522	87	7	91.8	84	7	90.5	9	12	2.4	1	5	1.1	0	0	0.0
WASHINGTON	244	43	3	90.8	48	4	91.1	1	102	41.8	1	4	2.0	0	0	0.0
WEST VIRGINIA	72	15	2	83.8	15	2	84.8	1	4	6.6	4	19	26.8	0	0	0.0
WISCONSIN	1,677	396	44	88.7	434	67	84.5	57	1,506	89.8	31	116	6.9	0	0	0.0
PAC. TR. TERR.	0	0	0	0.0	0	0	30.7	0	0	0.0	0	0	0.0	0	0	0.0
U.S. TOTALS	32,759	6,498	752	88.4	8,157	1,011	87.6	440	11,468	34.9	493	10,613	32.3	0	0	0.0

NOTES: 1. FLOWS IN CUBIC METERS X 1000 2. METRIC TONS X .9072 = SHORT TONS

3. SUM OF ENTRIES MAY NOT EQUAL TOTALS DUE TO ROUND-OFFS

4. FACILITIES WITH ZERO DISCHARGE OR RAW DISCHARGE ARE NOT INCLUDED

Table 27

Plant Loadings, Removal Efficiencies, and Discharge Rates for Facilities to be in Operation in 2000—Facilities Designed to Provide Advanced Secondary Treatment

(Metric Tons per Day)

Table 27 summarizes the expected performance, in the year 2000, of all treatment facilities designed to provide advanced secondary treatment. Information is provided for all States and U.S. Territories, with a national total at the bottom of the table.

This table is designed to estimate the quantities of various pollutants that will be received by a treatment plant and the quantities of these same pollutants that will be in the effluent. Quantities are given in metric tons per day for all parameters. BOD and Solids are summarized in this table. Information is also provided on nutrient removal capabilities.

Plants with Removal Capabilities are facilities with a specific requirement to remove the listed nutrient. For instance, some phosphorus is removed in all treatment plants. However, only plants specifically designed to remove phosphorus are reported in this category. Reported for each nutrient are the total number of plants with removal capabilities and the total average daily flow received by these plants. Also given is the percentage of the total State flow the plants represent.

These data are derived from the daily average flow, daily average influent concentrations, and the daily average effluent concentrations. The averages are based on the predicted year 2000 situation. The values calculated for each plant are summed into State and national totals.

Table 27 is an extension of Tables 25 and 26.

Total Flow is the sum of the average daily flows to be treated in the year 2000 by all facilities within the State that will be designed to provide advanced secondary treatment.

All flows are reported in thousands of cubic meters per day.

		REMOVAL EFFICIENCIES						PLANTS WITH REMOVAL CAPABILITY								
		BOD5			SOLIDS			PHOSPHORUS			NH3 NITROGEN			TOTAL N		
STATE	TOTAL FLOW	INF.	EFF.	% REM.	INF.	EFF.	% REM.	# PLANTS	FLOW	% TOT. FLOW	# PLANTS	FLOW	% TOT. FLOW	# PLANTS	FLOW	% TOT. FLOW
ALABAMA	788	157	12	92.2	159	22	85.8	0	0	0.0	115	726	92.1	0	0	0.0
ALASKA	15	2	0	88.8	2	0	87.2	0	0	0.0	0	0	0.0	0	0	0.0
ARIZONA	10	2	0	91.6	2	0	90.4	1	0	0.3	0	0	0.0	0	0	0.0
ARKANSAS	577	138	6	95.4	127	8	93.0	0	0	0.0	0	0	0.0	0	0	0.0
CALIFORNIA	3,605	1,106	57	94.7	1,233	59	95.1	4	273	7.5	11	430	11.9	0	0	0.0
COLORADO	1,084	249	23	90.4	264	23	90.9	6	58	5.3	24	948	87.5	0	0	0.0
CONNECTICUT	341	71	5	91.9	66	4	93.1	10	267	78.4	9	243	71.3	0	0	0.0
DELAWARE	580	136	7	94.3	134	11	91.6	6	74	12.9	1	11	1.9	0	0	0.0
FLORIDA	2,474	507	48	90.4	532	54	89.8	9	300	12.1	94	487	19.7	0	0	0.0
GEORGIA	2,352	484	35	92.7	477	59	87.5	28	502	21.3	143	1,968	83.6	0	0	0.0
HAWAII	12	2	0	91.8	3	0	92.1	0	0	0.0	0	0	0.0	0	0	0.0
IDAHO	160	33	3	90.4	35	4	87.7	1	4	2.7	4	130	80.9	0	0	0.0
ILLINOIS	10,508	1,693	118	92.9	2,355	143	93.9	46	599	5.7	83	7,773	73.9	0	0	0.0
INDIANA	3,032	612	40	93.4	699	40	94.2	73	1,337	44.0	23	1,888	62.2	0	0	0.0
IOWA	814	272	13	94.8	227	20	90.9	0	0	0.0	104	759	93.1	0	0	0.0
KANSAS	101	23	1	95.0	18	1	93.7	0	0	0.0	0	0	0.0	0	0	0.0
KENTUCKY	1,144	240	18	92.4	276	29	89.5	2	5	0.4	237	736	64.3	0	0	0.0
LOUISIANA	206	43	2	93.7	42	5	87.8	0	0	0.0	0	0	0.0	0	0	0.0
MAINE	9	3	0	94.1	3	0	93.7	9	9	96.1	0	0	0.0	0	0	0.0
MARYLAND	1,252	301	23	92.1	281	22	9[illegible].1	18	856	68.4	11	655	52.3	0	0	0.0
MASSACHUSETTS	609	125	9	92.1	132	9	92.6	16	383	62.9	9	94	15.5	0	0	0.0
MICHIGAN	7,326	1,376	178	87.0	2,034	188	90.7	174	7,290	99.5	30	914	12.4	0	0	0.0
MINNESOTA	1,677	462	27	94.0	510	28	94.3	46	307	18.3	6	1,328	79.1	0	0	0.0
MISSISSIPPI	921	191	16	91.3	186	26	85.9	2	0	0.0	285	794	86.2	0	0	0.0
MISSOURI	141	41	1	96.0	27	1	94.2	0	0	0.0	1	113	80.1	0	0	0.0
MONTANA	49	8	1	85.2	8	1	85.2	0	0	0.0	2	41	83.9	0	0	0.0
NEVADA	411	82	9	88.7	82	9	88.7	2	405	98.3	1	151	36.7	0	0	0.0
NEW HAMPSHIRE	50	10	0	91.6	11	0	93.1	4	34	67.8	7	48	96.4	0	0	0.0
NEW JERSEY	953	215	16	92.3	213	18	91.3	10	127	13.3	26	413	43.4	0	0	0.0
NEW MEXICO	38	8	1	88.1	7	1	87.0	6	25	67.2	1	0	1.5	0	0	0.0
NEW YORK	3,719	792	78	90.1	835	85	89.7	58	2,776	74.6	44	364	9.8	0	0	0.0
NORTH CAROLINA	1,389	372	20	94.4	314	39	87.5	9	53	3.8	200	1,171	84.3	0	0	0.0
OHIO	4,622	961	75	92.1	1,044	85	91.8	133	3,760	81.3	290	2,885	61.5	0	0	0.0
OKLAHOMA	1,378	309	21	93.1	341	28	91.6	4	148	10.7	31	633	45.9	0	0	0.0
OREGON	1,531	365	23	93.5	350	23	93.2	1	56	3.7	1	56	3.7	0	0	0.0
PENNSYLVANIA	5,430	1,152	102	91.1	1,317	129	90.1	209	1,490	27.4	332	2,412	44.4	0	0	0.0
RHODE ISLAND	182	50	2	95.1	47	2	93.9	2	6	3.2	4	168	92.0	0	0	0.0
SOUTH CAROLINA	512	154	9	94.0	105	13	86.7	16	69	13.5	70	471	92.0	0	0	0.0
SOUTH DAKOTA	169	52	3	94.1	50	3	93.4	0	0	0.0	13	158	93.7	0	0	0.0
TENNESSEE	1,994	557	36	93.4	447	46	89.5	12	3	0.1	170	1,980	99.3	0	0	0.0
TEXAS	3,295	843	33	96.0	847	49	94.1	4	65	1.9	36	751	22.8	0	0	0.0
UTAH	1,047	206	11	94.2	224	10	95.3	0	0	0.0	0	0	0.0	0	0	0.0
VERMONT	114	24	2	91.0	23	2	90.5	25	79	69.3	13	41	36.4	0	0	0.0
VIRGINIA	929	220	15	92.7	205	15	92.2	9	65	6.9	5	43	4.6	0	0	0.0
WASHINGTON	863	195	15	91.8	236	21	90.7	3	217	25.2	2	583	67.5	0	0	0.0
WEST VIRGINIA	271	80	3	95.8	77	3	95.4	2	8	3.1	24	151	55.8	0	0	0.0
WISCONSIN	3,132	769	77	89.9	772	78	89.7	84	2,552	81.4	107	636	20.3	0	0	0.0
WYOMING	86	18	2	86.3	22	2	88.2	0	0	0.0	4	86	100.0	0	0	0.0
N. MARIANAS	19	2	0	85.1	2	0	85.1	0	0	0.0	0	0	0.0	0	0	0.0
PUERTO RICO	38	9	0	91.9	8	0	90.9	1	16	41.9	3	18	47.2	0	0	0.0
PAC. TR. TERR.	8	1	0	85.5	1	0	85.5	0	0	0.0	0	0	0.0	0	0	0.0
U.S. TOTALS	71,993	15,749	1,218	92.2	17,434	1,442	91.7	1,045	24,234	33.6	2,576	33,241	46.1	0	0	0.0

NOTES: 1. FLOWS IN CUBIC METERS X 1000 2. METRIC TONS X .9072 = SHORT TONS

3. SUM OF ENTRIES MAY NOT EQUAL TOTALS DUE TO ROUND-OFFS

4. FACILITIES WITH ZERO DISCHARGE OR RAW DISCHARGE ARE NOT INCLUDED

Table 28

Number of Plants Projected for Advanced Secondary Treatment by Year 2000—by Total Projected Design Flow

Table 28 is a flow summary for all advanced secondary treatment plants projected to be in operation by the year 2000. The treatment levels attained by advanced secondary plants are defined in terms of the effluent BOD concentration and/or the removal of nutrients, phosphorus (as PO_4), and/or ammonia (NH_3). A plant is considered to be advanced secondary in design if it is capable of consistently producing an effluent with a BOD concentration in the range of 24 to 10 mg/l; and/or, it has specific processes which remove phosphorus and/or ammonia in excess of the amounts normally removed by secondary treatment. A summary is provided for each State and U.S. Territory. National totals are summarized at the bottom of the table.

In the first column the total number of projected advanced secondary treatment plants in each State is reported along with the total wastewater treatment capacity represented by the plants. The Projected Design Flow for each plant was used to calculate the total treatment capacity value. The total State flows are reported in thousands of cubic meters per day.

Subsequent columns provide a breakdown of the State totals into seven flow ranges. The ranges are specified in the column headings and are reported in thousands of cubic meters per day and, in parentheses beneath that heading as million gallons per day. Reported for each flow range are the number of plants in the range and the percentage of the total State advanced secondary treatment capacity that is accounted for by each flow range.

Included in this summary are all advanced secondary plants in operation in 1980 which will not be abandoned or upgraded between 1980 and 2000; primary, advanced primary, and secondary plants which will be upgraded to advanced secondary levels before 2000; and new advanced secondary plants which will be constructed prior to 2000.

			PLANTS AND PERCENT OF FLOW BY FLOW RANGE											
			0-.4 (0-.10)		.401-1.9 (.11-.50)		1.901-4 (.51-1.05)		4.001-19 (1.06-5.01)		19.001-40 (5.02-10.56)		40.001-190 (10.57-50.19)	
STATE	TOTAL PLANTS	TOTAL DESIGN FLOW	PLANTS	% FLOW	PLANTS	% FLOW	PLANTS	% FLOW	PLANTS	% FLOW	PLANTS	% FLOW	PLANTS	% FLOW
ALABAMA	127	788	28	0.8	46	5.5	14	5.3	33	36.5	4	15.7	2	35.9
ALASKA	3	15	0	0.0	1	7.2	0	0.0	2	92.7	0	0.0	0	0.0
ARIZONA	4	10	1	0.3	0	0.0	2	60.4	1	39.1	0	0.0	0	0.0
ARKANSAS	438	577	295	6.4	87	11.3	21	10.8	31	44.7	2	8.1	2	18.3
CALIFORNIA	66	3,605	0	0.0	11	0.3	5	0.3	19	5.2	14	10.8	14	35.7
COLORADO	35	1,084	3	0.0	5	0.5	4	1.1	17	14.8	3	7.4	2	13.6
CONNECTICUT	23	341	0	0.0	4	1.4	5	4.1	7	16.4	4	31.3	3	46.6
DELAWARE	17	580	2	0.0	3	0.7	7	3.3	2	3.8	0	0.0	2	25.7
DIST. OF COLUM.	0	0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
FLORIDA	199	2,474	21	0.2	73	2.9	31	3.6	47	19.2	14	16.4	12	39.1
GEORGIA	175	2,352	28	0.2	60	2.2	24	2.8	34	13.4	15	17.3	13	48.6
HAWAII	2	12	0	0.0	1	6.2	0	0.0	1	93.7	0	0.0	0	0.0
IDAHO	6	160	0	0.0	0	0.0	1	1.4	2	10.2	1	17.6	2	70.6
ILLINOIS	391	10,508	36	0.0	130	1.3	71	1.8	105	9.0	21	5.7	23	16.5
INDIANA	438	3,032	202	1.2	148	4.4	27	2.6	41	13.1	5	4.5	12	35.8
IOWA	111	814	14	0.4	47	6.2	17	5.9	25	23.9	4	12.9	4	50.4
KANSAS	6	101	0	0.0	1	0.5	1	3.7	3	21.3	0	0.0	1	74.3
KENTUCKY	245	1,144	105	2.0	75	5.7	20	4.2	40	34.2	2	3.9	2	21.6
LOUISIANA	34	206	7	0.6	6	3.1	3	3.6	15	57.0	3	35.4	0	0.0
MAINE	11	9	7	10.3	2	12.2	1	20.3	1	57.0	0	0.0	0	0.0
MARYLAND	260	1,252	154	1.7	63	4.9	16	3.7	13	11.9	8	19.8	4	18.4
MASSACHUSETTS	27	609	0	0.0	5	0.9	3	1.3	13	19.0	2	8.6	3	35.1
MICHIGAN	187	7,326	6	0.0	41	0.6	43	1.6	67	7.7	12	4.4	13	18.0
MINNESOTA	58	1,677	13	0.1	20	1.1	7	1.0	11	5.3	2	2.7	4	24.0
MISSISSIPPI	321	921	198	3.5	79	6.7	17	5.3	20	21.7	4	13.3	1	5.6
MISSOURI	12	141	6	0.8	2	1.3	1	1.6	2	16.0	0	0.0	1	80.1
MONTANA	4	89	0	0.0	1	2.2	0	0.0	2	34.3	1	63.3	0	0.0
NEBRASKA	0	0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
NEVADA	4	411	0	0.0	1	0.3	0	0.0	1	1.3	0	0.0	1	36.7
NEW HAMPSHIRE	9	50	2	0.9	3	6.6	1	4.6	2	27.1	1	60.5	0	0.0
NEW JERSEY	65	953	3	0.1	10	1.4	12	3.8	33	37.6	3	8.3	3	18.9
NEW MEXICO	11	38	0	0.0	3	4.4	5	41.2	3	54.2	0	0.0	0	0.0
NEW YORK	212	3,719	51	0.2	57	1.7	29	2.1	45	10.5	14	10.5	13	31.9
NORTH CAROLINA	230	1,389	131	0.9	36	2.2	14	2.9	26	20.1	13	26.6	10	46.9
NORTH DAKOTA	0	0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
OHIO	524	4,622	198	0.8	173	3.2	39	2.4	70	14.8	22	12.5	18	30.0
OKLAHOMA	340	1,378	128	1.8	126	8.4	28	5.8	45	29.9	8	14.6	4	22.7
OREGON	125	1,531	16	0.2	48	3.4	20	3.8	26	16.4	8	15.6	6	35.7
PENNSYLVANIA	493	5,430	107	0.4	178	3.5	68	3.5	104	17.5	22	10.3	9	13.3
RHODE ISLAND	7	182	1	0.1	0	0.0	0	0.0	2	7.7	2	22.0	2	70.0
SOUTH CAROLINA	116	512	52	1.8	32	6.4	9	5.2	15	26.2	7	40.1	1	19.9
SOUTH DAKOTA	17	169	3	0.4	3	1.6	3	5.8	6	28.3	0	0.0	2	63.6
TENNESSEE	182	1,994	42	0.5	64	2.9	25	3.4	39	17.7	4	5.5	6	24.1
TEXAS	341	3,295	83	0.5	123	4.1	54	4.6	55	15.0	10	7.1	13	28.3
UTAH	176	1,047	102	1.7	42	3.6	8	2.2	15	12.4	3	8.8	6	71.2
VERMONT	35	114	5	0.7	16	13.8	6	16.1	8	69.2	0	0.0	0	0.0
VIRGINIA	81	929	18	0.2	30	3.3	11	3.6	12	12.0	4	12.1	5	39.9
WASHINGTON	8	863	0	0.0	1	0.1	0	0.0	1	1.7	4	14.6	1	17.5
WEST VIRGINIA	92	271	44	3.1	29	10.8	7	7.9	9	32.8	1	7.0	2	38.0
WISCONSIN	261	3,132	63	0.4	97	3.0	43	3.9	37	11.6	6	4.6	12	31.1
WYOMING	4	86	0	0.0	2	1.5	0	0.0	1	19.3	0	0.0	1	79.1
AMERICAN SAMOA	0	0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
GUAM	0	0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
N. MARIANAS	2	19	0	0.0	0	0.0	0	0.0	2	100.0	0	0.0	0	0.0
PUERTO RICO	5	38	0	0.0	0	0.0	1	9.8	4	90.1	0	0.0	0	0.0
PAC. TR. TERR.	3	8	0	0.0	2	31.8	0	0.0	1	68.1	0	0.0	0	0.0
VIRGIN ISLANDS	0	0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
U.S. TOTALS	6,543	71,993	2,175	0.5	1,987	2.6	724	2.8	1,116	14.3	253	9.6	235	27.1

STATE	190.001+ (50.2+) PLANTS	% FLOW
ALABAMA	0	0.0
ALASKA	0	0.0
ARIZONA	0	0.0
ARKANSAS	0	0.0
CALIFORNIA	3	47.4
COLORADO	1	62.3
CONNECTICUT	0	0.0
DELAWARE	1	66.2
DIST. OF COLUM.	0	0.0
FLORIDA	1	18.3
GEORGIA	1	15.1
HAWAII	0	0.0
IDAHO	0	0.0
ILLINOIS	5	65.3
INDIANA	3	38.0
IOWA	0	0.0
KANSAS	0	0.0
KENTUCKY	1	28.1
LOUISIANA	0	0.0
MAINE	0	0.0
MARYLAND	2	39.3
MASSACHUSETTS	1	[illegible]
MICHIGAN	5	67.3
MINNESOTA	1	65.4
MISSISSIPPI	2	43.7
MISSOURI	0	0.0
MONTANA	0	0.0
NEBRASKA	0	0.0
NEVADA	1	61.5
NEW HAMPSHIRE	0	0.0
NEW JERSEY	1	29.7
NEW MEXICO	0	0.0
NEW YORK	3	42.7
NORTH CAROLINA	0	0.0
NORTH DAKOTA	0	0.0
OHIO	4	35.7
OKLAHOMA	1	16.4
OREGON	1	24.7
PENNSYLVANIA	5	51.2
RHODE ISLAND	0	0.0
SOUTH CAROLINA	0	0.0
SOUTH DAKOTA	0	0.0
TENNESSEE	2	45.5
TEXAS	3	40.1
UTAH	0	0.0
VERMONT	0	0.0
VIRGINIA	1	28.5
WASHINGTON	1	65.7
WEST VIRGINIA	0	0.0
WISCONSIN	3	45.0
WYOMING	0	0.0
AMERICAN SAMOA	0	0.0
GUAM	0	0.0
N. MARIANAS	0	0.0
PUERTO RICO	0	0.0
PAC. TR. TERR.	0	0.0
VIRGIN ISLANDS	0	0.0
U.S. TOTALS	53	42.6

NOTES: 1. FLOW RANGE VALUES IN CUBIC METERS PER DAY X 1000. (APPROXIMATE MGD IN PARENTHESES).

2. TOTAL STATE FLOW IN CUBIC METERS PER DAY X 1000.

Table 29

Number of New Advanced Secondary Treatment Plants to be Built Between 1980 and 2000—by Total Projected Flow

Table 29 is a flow summary for all new advanced secondary treatment plants which will be constructed between 1980 and 2000. The treatment levels attained by advanced secondary plants are defined in terms of the effluent BOD concentration and/or the removal of nutrients, phosphorus (as PO4), and/or ammonia (NH3). A plant is considered to be advanced secondary in design if it is capable of consistently producing an effluent with a BOD concentration in the range of 24 to 10 mg/l; and/or, it has specific processes which remove phosphorus and/or ammonia in excess of the amounts normally removed by secondary treatment. A summary is provided for each State and U.S. Territory. National totals are summarized at the bottom of the table.

In the first column the total number of new advanced secondary treatment plants to be constructed in each State is reported along with the total wastewater treatment capacity represented by the plants. The Projected Design Flow for each plant was used to calculate the total treatment capacity value. The total State flows are reported in thousands of cubic meters per day.

Subsequent columns provide a breakdown of the State totals into seven flow ranges. The ranges are specified in the column headings and are reported in thousands of cubic meters per day and in parentheses beneath that, as million gallons per day. Reported for each flow range are the number of plants in the range and the percentage of the State advanced secondary treatment capacity that is accounted for by each flow range.

Included in this summary are entirely new advanced secondary plants which are planned to be constructed by the year 2000. Excluded are advanced secondary plants that were operational in 1980; and primary, advanced primary, and secondary plants planned to be upgraded to advanced secondary treatment by the year 2000.

			PLANTS AND PERCENT OF FLOW BY FLOW RANGE													
			0-,4 (0-,10)		,401-1,9 (,11-,50)		1,901-4 (,51-1,05)		4,001-19 (1,06-5,01)		19,001-40 (5,02-10,56)		40,001-190 (10,57-50,19)		190,001+ (50,2+)	
STATE	TOTAL PLANTS	TOTAL DESIGN FLOW	PLANTS	% FLOW	PLANTS	% FLOW	PLANTS	% FLOW	PLANTS	% FLOW	PLANTS	% FLOW	PLANTS	% FLOW	PLANTS	% FLOW
ALABAMA	38	40	23	13,8	12	21,9	1	4,7	2	59,3	0	0,0	0	0,0	0	0,0
ALASKA	0	0	0	0,0	0	0,0	0	0,0	0	0,0	0	0,0	0	0,0	0	0,0
ARIZONA	0	0	0	0,0	0	0,0	0	0,0	0	0,0	0	0,0	0	0,0	0	0,0
ARKANSAS	284	77	266	38,5	14	11,9	1	4,8	3	44,7	0	0,0	0	0,0	0	0,0
CALIFORNIA	3	457	0	0,0	1	0,1	0	0,0	0	0,0	0	0,0	1	29,5	1	70,3
COLORADO	1	0	1	99,9	0	0,0	0	0,0	0	0,0	0	0,0	0	0,0	0	0,0
CONNECTICUT	0	0	0	0,0	0	0,0	0	0,0	0	0,0	0	0,0	0	0,0	0	0,0
DELAWARE	1	11	0	0,0	0	0,0	0	0,0	1	99,9	0	0,0	0	0,0	0	0,0
DIST. OF COLUM.	0	0	0	0,0	0	0,0	0	0,0	0	0,0	0	0,0	0	0,0	0	0,0
FLORIDA	108	480	21	1,0	55	11,1	15	8,5	11	21,0	2	14,1	4	44,0	0	0,0
GEORGIA	54	177	17	2,3	24	8,9	3	3,7	7	34,8	3	50,1	0	0,0	0	0,0
HAWAII	0	0	0	0,0	0	0,0	0	0,0	0	0,0	0	0,0	0	0,0	0	0,0
IDAHO	0	0	0	0,0	0	0,0	0	0,0	0	0,0	0	0,0	0	0,0	0	0,0
ILLINOIS	31	180	13	1,6	8	3,3	6	9,1	2	11,1	0	0,0	2	74,6	0	0,0
INDIANA	197	77	166	33,8	26	26,4	2	7,8	3	31,8	0	0,0	0	0,0	0	0,0
IOWA	1	7	0	0,0	0	0,0	0	0,0	1	99,9	0	0,0	0	0,0	0	0,0
KANSAS	3	21	0	0,0	0	0,0	1	18,0	2	81,9	0	0,0	0	0,0	0	0,0
KENTUCKY	111	413	78	3,8	26	4,6	2	1,1	3	7,1	1	5,3	0	0,0	1	77,7
LOUISIANA	10	36	5	2,5	1	1,3	1	6,4	2	26,8	1	62,8	0	0,0	0	0,0
MAINE	8	3	6	21,9	1	19,7	1	58,2	0	0,0	0	0,0	0	0,0	0	0,0
MARYLAND	178	96	137	20,2	32	29,6	5	15,0	4	35,0	0	0,0	0	0,0	0	0,0
MASSACHUSETTS	7	139	0	0,0	2	1,6	0	0,0	3	12,9	1	15,2	1	70,1	0	0,0
MICHIGAN	22	216	5	0,5	10	4,5	4	4,8	2	8,7	0	0,0	1	81,2	0	0,0
MINNESOTA	4	27	1	0,9	2	12,1	0	0,0	0	0,0	1	86,8	0	0,0	0	0,0
MISSISSIPPI	210	135	179	20,4	25	12,0	2	3,6	3	25,2	0	0,0	1	38,6	0	0,0
MISSOURI	5	3	3	9,4	1	20,0	1	70,5	0	0,0	0	0,0	0	0,0	0	0,0
MONTANA	0	0	0	0,0	0	0,0	0	0,0	0	0,0	0	0,0	0	0,0	0	0,0
NEBRASKA	0	0	0	0,0	0	0,0	0	0,0	0	0,0	0	0,0	0	0,0	0	0,0
NEVADA	0	0	0	0,0	0	0,0	0	0,0	0	0,0	0	0,0	0	0,0	0	0,0
NEW HAMPSHIRE	5	15	1	0,7	2	12,4	0	0,0	2	86,7	0	0,0	0	0,0	0	0,0
NEW JERSEY	14	104	0	0,0	6	8,3	3	10,1	4	52,8	1	28,7	0	0,0	0	0,0
NEW MEXICO	0	0	0	0,0	0	0,0	0	0,0	0	0,0	0	0,0	0	0,0	0	0,0
NEW YORK	93	335	44	2,5	29	8,6	10	8,2	6	10,5	1	6,7	3	63,2	0	0,0
NORTH CAROLINA	65	225	37	3,1	18	5,6	2	2,6	4	16,9	3	38,0	1	33,5	0	0,0
NORTH DAKOTA	0	0	0	0,0	0	0,0	0	0,0	0	0,0	0	0,0	0	0,0	0	0,0
OHIO	149	196	104	11,8	36	12,6	1	1,9	5	21,0	2	29,4	1	23,0	0	0,0
OKLAHOMA	57	293	43	2,5	8	2,1	1	1,2	3	9,1	1	7,4	0	0,0	1	77,3
OREGON	19	82	10	2,7	4	4,7	1	2,5	2	16,1	2	73,8	0	0,0	0	0,0
PENNSYLVANIA	171	224	65	6,7	75	36,7	21	23,8	9	23,7	1	8,9	0	0,0	0	0,0
* RHODE ISLAND	2	26	0	0,0	0	0,0	0	0,0	1	21,4	1	78,5	0	0,0	0	0,0
SOUTH CAROLINA	67	73	49	12,3	13	16,4	2	8,8	2	23,6	1	38,6	0	0,0	0	0,0
SOUTH DAKOTA	1	11	0	0,0	0	0,0	0	0,0	1	99,9	0	0,0	0	0,0	0	0,0
TENNESSEE	49	43	26	13,3	19	28,0	2	13,5	2	45,0	0	0,0	0	0,0	0	0,0
TEXAS	88	637	57	1,9	23	3,4	6	2,4	1	0,6	0	0,0	0	0,0	1	91,4
* UTAH	121	42	94	37,4	25	46,2	1	5,8	1	10,5	0	0,0	0	0,0	0	0,0
VERMONT	9	11	3	5,0	4	29,8	1	20,1	1	44,9	0	0,0	0	0,0	0	0,0
VIRGINIA	22	165	6	0,8	9	5,1	3	5,2	2	10,6	1	12,6	1	65,3	0	0,0
WASHINGTON	2	66	0	0,0	0	0,0	0	0,0	0	0,0	2	99,9	0	0,0	0	0,0
WEST VIRGINIA	69	57	43	14,3	20	33,1	3	16,0	3	36,5	0	0,0	0	0,0	0	0,0
WISCONSIN	17	18	10	8,9	4	24,6	2	33,4	1	32,8	0	0,0	0	0,0	0	0,0
WYOMING	0	0	0	0,0	0	0,0	0	0,0	0	0,0	0	0,0	0	0,0	0	0,0
AMERICAN SAMOA	0	0	0	0,0	0	0,0	0	0,0	0	0,0	0	0,0	0	0,0	0	0,0
GUAM	0	0	0	0,0	0	0,0	0	0,0	0	0,0	0	0,0	0	0,0	0	0,0
N. MARIANAS	1	9	0	0,0	0	0,0	0	0,0	1	99,9	0	0,0	0	0,0	0	0,0
PUERTO RICO	0	0	0	0,0	0	0,0	0	0,0	0	0,0	0	0,0	0	0,0	0	0,0
PAC. TR. TERR.	2	2	0	0,0	2	99,9	0	0,0	0	0,0	0	0,0	0	0,0	0	0,0
VIRGIN ISLANDS	0	0	0	0,0	0	0,0	0	0,0	0	0,0	0	0,0	0	0,0	0	0,0
U.S. TOTALS	2,299	5,249	1,513	4,9	537	8,9	104	5,4	100	16,1	25	12,9	16	23,7	4	27,6

NOTES: 1. FLOW RANGE VALUES IN CUBIC METERS PER DAY X 1000. (APPROXIMATE MGD IN PARENTHESES).

2. TOTAL STATE FLOW IN CUBIC METERS PER DAY X 1000.

Table 30

Dollar Needs for Construction of New Advanced Secondary Facilities—By Plant Size

(Thousands of 1980 Dollars)

Table 30 summarizes the projected costs, reported in January 1980 dollars, for the construction of new advanced secondary treatment plants to be built between 1980 and 2000. Table 30 is a direct extension of Table 29.

The summary indicates a total dollar need per State for new advanced secondary facilities. The State totals are broken down into dollar needs by flow range. An individual plant's dollar need is included in the total for the flow range which encompasses its projected design capacity.

TOTAL PROJECTED DESIGN FLOW

CUBIC METERS PER DAY X 1000: (MILLION GALLONS PER DAY)			0-.40 (0-.10)	.401-1.9 (.11-.50)	1.901-4.0 (.51-1.05)	4.001-19 (1.06-5.01)	19.001-40 (5.02-10.56)	40.001-190 (10.57-50.19)	190.001+ (50.2+)
STATE	# OF PLANTS	STATE NEEDS	NEEDS	NEEDS	NEEDS	NEEDS	NEEDS	NEEDS	NEEDS
ALABAMA	38	22,858	5,637	6,855	697	9,669	0	0	0
ALASKA	0	0	0	0	0	0	0	0	0
ARIZONA	0	0	0	0	0	0	0	0	0
ARKANSAS	284	55,607	33,092	6,897	176	15,442	0	0	0
CALIFORNIA	3	171,356	0	710	0	0	0	54,132	116,514
COLORADO	1	259	259	0	0	0	0	0	0
CONNECTICUT	0	0	0	0	0	0	0	0	0
DELAWARE	1	7,312	0	0	0	7,312	0	0	0
DIST. OF COLUM.	0	0	0	0	0	0	0	0	0
FLORIDA	108	301,596	6,274	44,650	29,536	73,937	47,104	100,095	0
GEORGIA	54	72,694	3,835	12,355	3,657	31,534	21,313	0	0
HAWAII	0	0	0	0	0	0	0	0	0
IDAHO	0	0	0	0	0	0	0	0	0
ILLINOIS	31	78,846	4,770	6,514	13,522	7,288	0	46,752	0
INDIANA	197	103,385	55,766	30,297	6,276	11,046	0	0	0
IOWA	1	10,587	0	0	0	10,587	0	0	0
KANSAS	3	9,280	0	0	2,050	7,230	0	0	0
KENTUCKY	111	174,140	24,838	19,267	2,867	9,275	12,587	0	105,306
LOUISIANA	10	18,625	944	621	1,957	7,065	8,038	0	0
MAINE	8	4,773	1,976	441	2,356	0	0	0	0
MARYLAND	178	75,114	31,984	16,600	5,746	20,784	0	0	0
MASSACHUSETTS	7	63,443	0	3,725	0	5,408	0	54,310	0
MICHIGAN	22	108,723	2,090	8,802	5,265	14,201	0	78,365	0
MINNESOTA	4	11,083	315	4,080	0	0	6,688	0	0
MISSISSIPPI	210	71,024	27,780	11,576	2,425	14,165	0	15,078	0
MISSOURI	5	2,783	361	607	1,815	0	0	0	0
MONTANA	0	0	0	0	0	0	0	0	0
NEBRASKA	0	0	0	0	0	0	0	0	0
NEVADA	0	0	0	0	0	0	0	0	0
NEW HAMPSHIRE	5	9,913	264	4,737	0	4,912	0	0	0
NEW JERSEY	14	73,016	0	6,155	6,535	43,022	17,304	0	0
NEW MEXICO	0	0	0	0	0	0	0	0	0
NEW YORK	93	161,173	12,997	36,223	26,028	25,208	17,754	42,963	0
NORTH CAROLINA	65	123,817	9,028	13,451	4,058	25,038	28,402	43,840	0
NORTH DAKOTA	0	0	0	0	0	0	0	0	0
OHIO	149	154,472	46,325	29,856	3,387	31,770	29,579	13,555	0
OKLAHOMA	57	71,923	7,098	4,459	946	13,050	8,729	0	36,641
OREGON	19	30,735	3,335	4,450	641	0	22,309	0	0
PENNSYLVANIA	171	189,416	26,257	77,750	36,657	36,226	12,526	0	0
RHODE ISLAND	2	23,127	0	0	0	75	23,052	0	0
SOUTH CAROLINA	67	34,513	11,872	10,895	2,776	4,828	4,142	0	0
SOUTH DAKOTA	1	0	0	0	0	0	0	0	0
TENNESSEE	49	32,514	9,761	11,772	1,100	9,881	0	0	0
TEXAS	88	115,651	14,591	16,972	10,659	2,653	0	0	70,776
UTAH	121	40,539	20,656	16,326	3,261	296	0	0	0
VERMONT	9	9,473	974	378	3,565	4,556	0	0	0
VIRGINIA	22	90,215	1,798	4,814	5,767	9,358	17,307	51,171	0
WASHINGTON	2	30,171	0	0	0	0	30,171	0	0
WEST VIRGINIA	69	35,806	8,928	12,486	6,276	8,116	0	0	0
WISCONSIN	17	18,516	2,375	4,234	5,000	6,907	0	0	0
WYOMING	0	0	0	0	0	0	0	0	0
AMERICAN SAMOA	0	0	0	0	0	0	0	0	0
GUAM	0	0	0	0	0	0	0	0	0
N. MARIANAS	1	6,622	0	0	0	6,622	0	0	0
PUERTO RICO	0	0	0	0	0	0	0	0	0
PAC. TR. TERR.	2	3,443	0	3,443	0	0	0	0	0
VIRGIN ISLANDS	0	0	0	0	0	0	0	0	0
U.S. TOTALS	2,299	2,618,543	376,180	432,398	195,001	478,261	307,005	500,261	329,437

Table 31

Populations Served by Tertiary Treatment—Present and Projected, Resident and Nonresident

(Population in Thousands)

Table 31 summarizes the 1980 populations served and the 2000 populations to be served by facilities designed to provide tertiary treatment. The treatment levels attained by tertiary plants are defined in terms of the effluent BOD concentration and/or the removal of nitrogen. A plant is considered to be tertiary in design if it is capable of consistently producing an effluent with a BOD concentraion less than 10 mg/l; and/or, it has specific processes which can remove more than 50 percent of the total nitrogen present in the plant influent.

The 1980 and 2000 total State population values reported are from estimates obtained from the BEA. The percent served is a function of the residents receiving treatment in relation to the total State population estimated by BEA.

The total population within the service area of an authority is the sum of persons Receiving Treatment and Not Receiving Treatment. Those not receiving treatment reside in the service area but do not contribute to the treatment facility because they are not on a sewer system.

Resident populations are permanent residents in the service area of a sewerage authority. Nonresident populations include commuters living in one area and working in another, as well as temporary residents at resort areas and similar locations.

	POPULATION		RECEIVING TREATMENT				NOT RECEIVING TREATMENT				PERCENT SERVED		TREATMENT PLANTS	
STATE	1980 TOTAL	2000 TOTAL	1980 RES.	2000 RES.	1980 NONRES	2000 NONRES	1980 RES.	2000 RES.	1980 NONRES	2000 NONRES	1980	2000	1980	2000
ALABAMA	3,769	4,140	0	98	0	3	0	0	0	0	0.0	2.2	0	3
ALASKA	406	667	0	0	0	0	0	0	0	0	0.0	0.0	0	0
ARIZONA	2,450	4,149	0	0	0	0	0	0	0	0	0.0	0.0	0	0
ARKANSAS	2,180	2,970	3	257	0	6	0	0	0	0	0.1	8.6	4	32
CALIFORNIA	22,696	26,786	767	2,861	102	133	6	0	0	0	3.3	10.6	15	13
COLORADO	2,772	4,371	2	120	6	10	0	0	0	0	0.0	2.7	1	2
CONNECTICUT	3,115	3,741	31	93	0	0	9	13	0	0	0.9	2.5	2	3
DELAWARE	582	841	3	6	0	0	0	0	0	0	0.6	0.7	1	1
DIST. OF COLUM.	656	661	0	811	0	2,339	0	0	0	0	0.0	122.6	0	1
FLORIDA	8,860	15,049	640	2,309	84	305	70	65	0	0	7.2	15.3	14	40
GEORGIA	5,118	7,053	35	141	1	4	0	11	1	0	0.6	2.0	2	5
HAWAII	915	1,366	0	0	0	0	0	0	0	0	0.0	0.0	0	0
IDAHO	905	1,183	7	123	0	8	0	3	0	0	0.8	10.4	1	6
ILLINOIS	11,230	12,358	322	411	0	0	4	0	0	0	2.8	3.3	18	13
INDIANA	5,400	6,059	155	595	0	0	11	0	0	0	2.8	9.8	9	20
IOWA	2,903	3,101	0	0	0	0	0	0	0	0	0.0	0.0	0	0
KANSAS	2,369	2,517	0	0	0	0	0	0	0	0	0.0	0.0	0	0
KENTUCKY	3,527	4,224	1	5	0	0	0	0	0	0	0.0	0.1	1	3
LOUISIANA	4,026	4,659	82	181	0	0	0	0	0	0	2.0	3.8	3	5
MAINE	1,097	1,222	0	26	0	0	0	7	0	0	0.0	2.1	0	4
MARYLAND	4,149	5,583	122	1,863	0	2	0	28	0	0	2.9	33.3	7	12
MASSACHUSETTS	5,769	6,614	47	529	0	2	36	171	0	0	0.8	8.0	3	12
MICHIGAN	9,208	10,314	388	835	30	40	81	12	0	0	4.2	8.1	8	16
MINNESOTA	4,060	4,505	44	350	0	1	0	1	0	0	1.0	7.7	11	86
MISSISSIPPI	2,406	2,740	0	27	0	2	0	2	0	0	0.0	1.0	0	3
MISSOURI	4,868	5,225	18	67	0	3	0	0	0	0	0.3	1.2	3	18
MONTANA	786	938	0	0	0	0	0	0	0	0	0.0	0.0	0	0
NEBRASKA	1,574	1,734	0	0	0	0	0	0	0	0	0.0	0.0	0	0
NEVADA	702	1,312	0	93	0	68	0	0	0	0	0.0	7.0	0	4
NEW HAMPSHIRE	887	1,306	0	63	2	5	0	42	0	0	0.6	4.8	1	6
NEW JERSEY	7,332	8,747	135	1,401	0	92	55	8	0	0	1.8	16.0	5	19
NEW MEXICO	1,241	1,781	0	0	0	0	0	0	0	0	0.0	0.0	0	0
NEW YORK	17,649	18,922	173	715	16	187	70	78	0	2	0.9	3.7	25	93
NORTH CAROLINA	5,606	7,419	341	1,495	8	51	173	222	0	0	6.0	20.1	29	145
NORTH DAKOTA	657	690	0	0	0	0	0	0	0	0	0.0	0.0	0	0
OHIO	10,731	12,031	505	3,589	23	45	119	17	0	0	4.7	29.8	37	129
OKLAHOMA	2,892	3,702	0	2	0	0	0	0	0	0	0.0	0.0	0	1
OREGON	2,527	3,209	67	144	0	6	3	0	0	0	2.6	4.5	1	4
PENNSYLVANIA	11,731	12,365	129	709	6	24	30	26	0	0	1.0	5.7	12	32
RHODE ISLAND	929	1,033	0	0	0	0	0	0	0	0	0.0	0.0	0	0
SOUTH CAROLINA	2,932	3,700	3	21	0	0	0	0	0	0	0.1	0.5	1	6
SOUTH DAKOTA	689	730	0	23	0	0	0	0	0	0	0.0	3.1	0	1
TENNESSEE	4,380	5,573	16	251	0	1	12	20	0	0	0.3	4.5	4	13
TEXAS	13,385	18,069	135	3,237	80	132	6	0	15	0	1.0	17.9	19	27
UTAH	1,367	1,688	0	0	0	0	0	0	0	0	0.0	0.0	0	0
VERMONT	493	607	0	37	0	5	0	1	0	0	0.0	6.1	0	1
VIRGINIA	5,197	6,755	643	2,141	0	9	12	7	0	0	12.3	31.7	5	28
WASHINGTON	3,926	4,859	0	0	3	12	0	0	0	0	0.0	0.0	1	2
WEST VIRGINIA	1,878	2,003	83	194	0	0	17	0	0	0	4.4	9.7	6	14
WISCONSIN	4,720	5,553	7	26	1	0	0	0	0	0	0.1	0.4	2	3
WYOMING	450	484	0	0	0	0	0	0	0	0	0.0	0.0	0	0
AMERICAN SAMOA	31	40	0	0	0	0	0	0	0	0	0.0	0.0	0	0
GUAM	114	275	0	0	0	0	0	0	0	0	0.0	0.0	0	0
N. MARIANAS	17	31	0	0	0	0	0	0	0	0	0.0	0.0	0	0
PUERTO RICO	3,358	4,700	0	0	0	0	0	0	0	0	0.0	0.0	0	0
PAC. TR. TERR.	111	174	0	0	0	0	0	0	0	0	0.0	0.0	0	0
VIRGIN ISLANDS	96	116	0	0	0	0	0	0	0	0	0.0	0.0	0	0
U.S. TOTAL	223,824	272,644	4,917	25,867	367	3,505	722	742	16	3	2.1	9.4	251	826

Table 32

Plant Loadings, Removal Efficiencies, and Discharge Rates for Facilities in Operation in 1980—Facilities Designed to Provide Tertiary Treatment

(Metric Tons per Day)

Table 32 summarizes the performance of all treatment facilities designed to provide tertiary treatment. Information is provided for all States and U.S. Territories which have tertiary treatment facilities with a national total at the bottom of the table. The table is designed to estimate the quantities of various pollutants accepted by a treatment plant and the quantities of these same pollutants in the effluent. Quantities are given in metric tons per day for all parameters. BOD and Solids are summarized in this table. Information is also provided on nutrient removal capabilities.

Plants with Removal Capabilities are facilities with a specific requirement to remove the listed nutrient. For instance, some phosphorus is removed in all treatment plants. However, only plants specifically designed to remove phosphorus are reported in this category. Reported for each nutrient are the total number of plants with their removal capabilities and the total average flow received by these plants. Also given is the percentage of the total State flow the plants represent.

These data are derived from the daily average flow, daily average influent concentrations, and the daily average effluent concentrations. The averages are based on the actual performance of each individual treatment plant during the most recent 12 month period from which information could be obtained. The values calculated for each plant are summed into the State and national totals. The main source of information for flow and concentrations values was the self-monitoring reports submitted by every facility with an NPDES permit.

Table 32 is an extension of Table 31. A summary of the projected year 2000 performance of all tertiary facilities is given in Table 33.

Total flow is the sum of the actual average daily flows treated by all facilities within the State designed to provide tertiary treatment.

All flows are reported in thousands of cubic meters per day.

		REMOVAL EFFICIENCIES						PLANTS WITH REMOVAL CAPABILITY								
		BOD5			SOLIDS *****			*** PHOSPHORUS			NH3 NITROGEN			TOTAL N		
STATE	TOTAL FLOW	INF.	EFF.	% REM.	INF.	EFF.	% REM.	# PLANTS	FLOW	% TOT. FLOW	# PLANTS	FLOW	% TOT. FLOW	# PLANTS	FLOW	% TOT. FLOW
ARKANSAS	1	0	0	96.3	0	0	91.3	0	0	0.0	0	0	0.0	0	0	0.0
CALIFORNIA	365	102	2	97.8	106	2	97.4	6	166	45.4	3	115	31.5	4	131	35.9
COLORADO	2	0	0	92.3	0	0	95.4	1	2	100.0	0	0	0.0	0	0	0.0
CONNECTICUT	9	1	0	87.3	1	0	86.2	1	4	50.8	0	0	0.0	0	0	0.0
DELAWARE	0	0	0	47.6	0	0	68.5	0	0	0.0	0	0	0.0	0	0	0.0
FLORIDA	305	75	28	62.1	63	12	81.1	10	254	83.2	6	54	17.9	5	193	63.4
GEORGIA	16	3	0	97.3	3	0	85.2	0	0	0.0	2	16	100.0	1	2	12.2
IDAHO	3	0	0	94.4	0	0	92.2	0	0	0.0	1	3	100.0	0	0	0.0
ILLINOIS	180	30	1	95.7	43	1	96.7	5	41	22.7	7	87	48.3	5	54	29.9
INDIANA	113	15	2	85.0	18	1	89.7	2	72	63.6	0	0	0.0	0	0	0.0
KENTUCKY	0	0	0	98.0	0	0	98.0	0	0	0.0	1	0	100.0	0	0	0.0
LOUISIANA	39	8	0	92.4	8	0	91.6	0	0	0.0	1	5	13.7	1	5	13.7
MARYLAND	49	9	0	95.1	9	0	95.4	4	26	53.8	1	11	22.8	1	4	8.1
MASSACHUSETTS	38	6	0	93.8	7	0	93.4	3	38	00.0	3	38	100.0	1	10	27.5
MICHIGAN	350	66	4	92.5	72	4	93.8	7	344	98.2	4	197	56.3	1	11	3.1
MINNESOTA	27	6	0	97.2	6	0	96.5	2	11	43.1	0	0	0.0	0	0	0.0
MISSOURI	8	2	0	97.3	2	0	95.3	0	0	0.0	0	0	0.0	0	0	0.0
NEW HAMPSHIRE	0	0	0	97.9	0	0	99.5	1	0	100.0	1	0	100.0	0	0	0.0
NEW JERSEY	86	18	1	94.5	18	1	94.3	2	24	28.7	5	86	100.0	1	22	25.7
NEW YORK	122	15	2	81.1	12	2	80.4	2	5	4.1	7	29	23.8	6	99	81.0
NORTH CAROLINA	210	54	3	93.0	45	6	85.2	0	0	0.0	27	196	93.3	0	0	0.0
OHIO	379	68	17	78.5	63	11	82.1	11	262	69.2	17	221	58.4	0	0	0.0
OREGON	29	5	0	96.9	7	0	97.1	1	29	100.0	0	0	0.0	0	0	0.0
PENNSYLVANIA	47	11	0	92.5	9	1	83.6	3	17	37.5	4	27	58.3	2	7	15.7
SOUTH CAROLINA	3	0	0	76.4	0	0	9.0	0	0	0.0	1	3	100.0	0	0	0.0
TENNESSEE	16	3	0	93.6	2	0	90.9	0	0	0.0	4	16	100.0	0	0	0.0
TEXAS	102	20	0	97.2	20	1	94.6	16	52	51.1	14	79	77.8	1	1	1.5
VIRGINIA	291	58	4	91.5	64	4	93.1	5	291	100.0	3	186	64.0	1	2	0.9
WASHINGTON	0	0	0	94.9	0	0	94.9	0	0	0.0	1	0	100.0	1	0	100.0
WEST VIRGINIA	36	8	1	81.5	6	1	78.7	1	2	6.5	3	10	27.5	4	28	77.2
WISCONSIN	4	1	0	77.2	1	0	78.6	2	4	100.0	0	0	0.0	0	0	0.0
U.S. TOTALS	2,845	598	75	87.3	598	56	90.5	85	1,653	58.1	118	1,389	48.8	55	574	20.1

NOTES: 1. FLOWS IN CUBIC METERS X 1000 2. METRIC TONS X .9072 = SHORT TONS

3. SUM OF ENTRIES MAY NOT EQUAL TOTALS DUE TO ROUND-OFFS

4. FACILITIES WITH ZERO DISCHARGE OR RAW DISCHARGE ARE NOT INCLUDED

Table 33

Plant Loadings, Removal Efficiencies and Discharge Rates for Facilities to be in Operation in 2000—Facilities Designed to Provide Tertiary Treatment

(Metric Tons per Day)

Table 33 summarizes the expected performance in the year 2000 of all treatment facilities designed to provide tertiary treatment. Information is provided for all States and U.S. Territories, which have tertiary treatment facilities, with a national total at the bottom of the table.

This table is designed to estimate the quantities of various pollutants that will be received by a treatment plant and the quantities of these same pollutants that will be in the effluent. Quantities are given in metric tons per day for all parameters. BOD and Solids are summarized in this table. Information is also provided on nutrient removal capabilities.

Plants with Removal Capabilities are facilities with a specific requirement to remove the listed nutrient. For instance, some phosphorus is removed in all treatment plants. However, only plants specifically designed to remove phosphorus are reported in this category. Reported for each nutrient are the total number of plants with removal capabilities and the total average daily flow received by these plants. Also given is the percentage of the total State flow the plants represent.

These data are derived from the daily average flow, daily average influent concentrations, and the daily average effluent concentrations. The averages are based on the predicted year 2000 situation. The values calculated for each plant are summed into State and national totals.

Table 33 is an extension of Tables 31 and 32.

Total Flow is the sum of the average daily flows to be treated in the year 2000 by all facilities within the State that will be designed to provide tertiary treatment.

All flows are reported in thousands of cubic meters per day.

		REMOVAL EFFICIENCIES						PLANTS WITH REMOVAL CAPABILITY								
		BOD5			SOLIDS			PHOSPHORUS			NH3 NITROGEN			TOTAL N		
STATE	TOTAL FLOW	INF.	EFF.	% REM.	INF.	EFF.	% REM.	# PLANTS	FLOW	% TOT. FLOW	# PLANTS	FLOW	% TOT. FLOW	# PLANTS	FLOW	% TOT. FLOW
ALABAMA	73	14	0	97.3	14	2	84.9	0	0	0.0	3	73	100.0	0	0	0.0
ARKANSAS	157	34	0	97.6	33	2	92.8	1	47	30.0	0	0	0.0	0	0	0.0
CALIFORNIA	1,407	403	10	97.3	453	10	97.6	6	410	29.1	5	956	67.9	4	362	25.7
COLORADO	35	14	0	97.8	8	0	96.2	1	5	15.7	1	30	84.2	0	0	0.0
CONNECTICUT	44	9	0	94.6	9	0	95.8	2	31	70.4	0	0	0.0	1	16	38.0
DELAWARE	1	0	0	95.7	0	0	95.7	0	0	0.0	0	0	0.0	0	0	0.0
DIST. OF COLUM.	1,169	280	5	97.9	280	8	97.0	1	1,169	100.0	1	1,169	100.0	1	1,169	100.0
FLORIDA	1,204	244	7	96.9	246	8	96.4	26	1,054	87.5	23	351	29.1	10	639	53.0
GEORGIA	81	17	0	96.2	17	2	85.8	0	0	0.0	5	81	100.0	3	41	51.2
IDAHO	130	32	2	92.5	31	2	91.5	2	11	[illegible]	5	88	68.0	3	67	52.1
ILLINOIS	275	52	2	95.0	63	2	95.3	5	95	34.9	10	144	52.9	10	135	49.7
INDIANA	516	95	3	95.9	107	3	96.4	6	355	68.7	4	344	66.7	1	227	43.9
KENTUCKY	3	0	0	96.4	0	0	92.8	0	0	0.0	3	3	100.0	1	1	39.5
LOUISIANA	79	16	0	95.9	16	1	90.7	0	0	0.0	1	7	9.7	1	7	9.7
MAINE	17	3	0	97.5	3	0	97.5	4	17	100.0	0	0	0.0	0	0	0.0
MARYLAND	1,036	248	5	97.7	209	5	97.3	5	1,017	98.1	2	885	85.4	2	105	10.2
MASSACHUSETTS	333	71	1	97.5	77	2	96.8	11	330	99.2	11	330	99.2	1	17	5.2
MICHIGAN	592	122	2	97.9	126	4	96.0	16	592	100.0	11	400	67.6	2	22	3.8
MINNESOTA	228	64	1	98.2	61	1	98.1	21	58	25.5	3	40	17.9	0	0	0.0
MISSISSIPPI	24	5	0	97.4	5	0	87.9	0	0	0.0	1	18	78.0	0	0	0.0
MISSOURI	34	8	0	97.9	8	0	95.9	0	0	0.0	0	0	0.0	0	0	0.0
NEVADA	54	15	0	96.7	12	0	95.9	4	54	100.0	2	31	58.3	4	54	100.0
NEW HAMPSHIRE	34	7	0	98.0	8	0	98.3	4	25	73.7	6	34	100.0	0	0	0.0
NEW JERSEY	680	166	4	97.1	181	5	97.2	6	115	17.0	16	662	97.4	10	238	35.1
NEW YORK	495	103	5	95.0	101	4	95.0	19	176	35.6	60	328	66.3	25	286	57.7
NORTH CAROLINA	920	234	5	97.4	199	26	86.8	3	0	0.0	134	868	94.3	2	0	0.0
OHIO	2,774	559	24	95.5	647	28	95.6	67	2,497	90.0	105	2,462	88.7	4	47	1.7
OKLAHOMA	1	0	0	95.9	0	0	95.9	0	0	0.0	1	1	100.0	0	0	0.0
OREGON	80	16	0	97.5	19	0	97.9	1	75	93.8	0	0	0.0	0	0	0.0
PENNSYLVANIA	348	81	2	96.5	71	4	93.5	16	232	66.5	22	214	61.6	11	75	21.7
SOUTH CAROLINA	11	2	0	97.4	2	0	86.3	1	0	2.6	5	11	98.9	0	0	0.0
SOUTH DAKOTA	10	3	0	96.6	3	0	96.6	0	0	0.0	1	10	100.0	0	0	0.0
TENNESSEE	141	32	0	97.6	30	2	92.4	0	0	0.0	13	141	100.0	1	22	16.0
TEXAS	1,581	407	7	98.0	415	9	97.8	19	99	6.3	22	1,543	97.6	1	2	0.1
VERMONT	22	4	0	97.4	4	0	94.9	0	0	0.0	1	22	100.0	0	0	0.0
VIRGINIA	934	216	3	98.3	224	2	98.9	12	809	86.6	6	444	47.6	9	292	31.3
WASHINGTON	3	0	0	95.0	0	0	95.0	1	0	27.3	2	3	100.0	2	3	100.0
WEST VIRGINIA	73	15	0	94.2	15	1	92.2	1	4	6.2	6	30	42.3	8	43	59.8
WISCONSIN	11	2	0	96.9	2	0	97.0	2	10	91.7	2	3	30.1	1	2	21.9
U.S. TOTALS	15,626	3,612	105	97.0	3,717	147	96.0	263	9,301	59.5	493	1,747	75.1	118	3,888	24.8

NOTES: 1. FLOWS IN CUBIC METERS X 1000 2. METRIC TONS X .9072 = SHORT TONS

3. SUM OF ENTRIES MAY NOT EQUAL TOTALS DUE TO ROUND-OFFS

4. FACILITIES WITH ZERO DISCHARGE OR RAW DISCHARGE ARE NOT INCLUDED

Table 34

Number of Plants Projected for Tertiary Treatment by Year 2000—By Total Projected Design Flow

Table 34 is a flow summary for all tertiary treatment plants projected to be in operation by the year 2000. The treatment levels attained by tertiary plants are defined in terms of the effluent BOD concentration and/or the removal of nitrogen. A plant is considered to be tertiary in design if it is capable of consistently producing an effluent with a BOD concentration less than 10 mg/l; and/or, it has specific processes which can remove more than 50 percent of the total nitrogen present in the plant influent. A summary is provided for each State and U.S. Territory. National totals are summarized at the bottom of the table.

In the first column the total number of projected tertiary treatment plants in each State is reported along with the total wastewater treatment capacity represented by the plants. The Projected Design Flow for each plant was used to calculate the total treatment capacity value. The total State flows are reported in thousands of cubic meters per day.

Subsequent columns provide a breakdown of the State totals into seven flow ranges. The ranges are specified in the column headings and are reported in thousands of cubic meters per day and, in parentheses beneath that heading, in million gallons per day. Reported for each flow range are the number of plants in the range and the percentage of the total State tertiary treatment capacity that is accounted for by each flow range.

Included in this summary are all tertiary plants in operation in 1980 which will not be abandoned between 1980 and 2000; primary, advanced primary, secondary, and advanced secondary plants which will be upgraded to tertiary levels before 2000; and new tertiary plants which will be constructed prior to 2000.

PLANTS AND PERCENT OF FLOW BY FLOW RANGE

STATE	TOTAL PLANTS	TOTAL DESIGN FLOW	0-.4 (0-.10)		.401-1.9 (.11-.50)		1.901-4 (.51-1.05)		4.001-19 (1.06-5.01)		19.001-40 (5.02-10.56)		40.001-190 (10.57-50.19)		190.001+ (50.2+)	
			PLANTS	% FLOW	PLANTS	% FLOW	PLANTS	% FLOW	PLANTS	% FLOW	PLANTS	% FLOW	PLANTS	% FLOW	PLANTS	% FLOW
ALABAMA	3	73	0	0.0	1	1.2	0	0.0	1	15.9	0	0.0	1	82.7	0	0.0
ALASKA	0	0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
ARIZONA	0	0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
ARKANSAS	32	157	6	0.8	11	8.2	4	6.9	10	53.8	0	0.0	1	30.0	0	0.0
CALIFORNIA	13	1,407	1	0.0	1	0.0	0	0.0	1	0.5	4	9.0	4	29.3	2	60.9
COLORADO	2	35	0	0.0	0	0.0	0	0.0	1	15.7	1	84.2	0	0.0	0	0.0
CONNECTICUT	3	44	0	0.0	0	0.0	0	0.0	3	99.9	0	0.0	0	0.0	0	0.0
DELAWARE	1	1	0	0.0	1	99.9	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
DIST. OF COLUM.	1	1,169	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1	99.9
FLORIDA	40	1,204	0	0.0	4	0.4	6	1.7	17	14.8	4	10.2	8	36.8	1	35.8
GEORGIA	5	81	0	0.0	0	0.0	0	0.0	4	74.4	1	25.5	0	0.0	0	0.0
HAWAII	0	0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
IDAHO	6	130	0	0.0	0	0.0	1	1.5	3	22.8	0	0.0	2	75.5	0	0.0
ILLINOIS	13	273	0	0.0	5	2.0	1	1.3	3	11.2	1	13.8	3	71.4	0	0.0
INDIANA	20	516	0	0.0	1	0.1	1	0.3	13	25.1	3	15.7	1	14.6	1	43.9
IOWA	0	0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
KANSAS	0	0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
KENTUCKY	3	3	0	0.0	3	99.9	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
LOUISIANA	5	79	0	0.0	1	0.9	1	4.0	1	9.7	1	28.4	1	56.8	0	0.0
MAINE	4	17	2	3.4	1	2.5	0	0.0	1	94.0	0	0.0	0	0.0	0	0.0
MARYLAND	12	1,036	4	0.0	1	0.0	2	0.4	2	2.9	0	0.0	2	19.7	1	76.7
MASSACHUSETTS	12	333	0	0.0	0	0.0	1	0.7	3	13.8	6	48.7	2	36.7	0	0.0
MICHIGAN	16	592	1	0.0	3	0.8	2	0.9	5	5.4	1	3.8	4	88.8	0	0.0
MINNESOTA	86	228	33	3.4	30	13.4	10	12.9	11	41.6	2	28.5	0	0.0	0	0.0
MISSISSIPPI	3	24	1	0.1	0	0.0	0	0.0	2	99.8	0	0.0	0	0.0	0	0.0
MISSOURI	18	34	7	5.8	8	20.0	0	0.0	3	74.1	0	0.0	0	0.0	0	0.0
MONTANA	0	0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
NEBRASKA	0	0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
NEVADA	4	54	0	0.0	1	1.0	0	0.0	1	16.3	2	82.6	0	0.0	0	0.0
NEW HAMPSHIRE	6	34	1	0.9	0	0.0	2	17.3	3	81.6	0	0.0	0	0.0	0	0.0
NEW JERSEY	19	680	0	0.0	0	0.0	1	0.3	10	16.1	3	11.1	4	30.6	1	41.7
NEW MEXICO	0	0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
NEW YORK	93	495	29	1.2	40	8.1	5	3.0	13	25.7	4	25.1	2	36.6	0	0.0
NORTH CAROLINA	145	920	80	1.0	25	2.7	12	3.5	16	19.2	7	22.5	5	50.9	0	0.0
NORTH DAKOTA	0	0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
OHIO	129	2,774	34	0.2	25	1.0	20	2.1	33	11.8	9	8.7	4	10.4	4	65.3
OKLAHOMA	1	1	0	0.0	1	99.9	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
OREGON	4	80	1	0.4	1	1.0	1	4.6	0	0.0	0	0.0	1	93.8	0	0.0
PENNSYLVANIA	32	348	1	0.0	9	2.8	7	5.9	10	31.1	4	31.7	1	28.2	0	0.0
RHODE ISLAND	0	0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
SOUTH CAROLINA	6	11	2	3.6	2	8.9	1	33.3	1	53.9	0	0.0	0	0.0	0	0.0
SOUTH DAKOTA	1	10	0	0.0	0	0.0	0	0.0	1	99.9	0	0.0	0	0.0	0	0.0
TENNESSEE	13	141	1	0.2	1	0.4	3	7.0	5	36.6	3	55.5	0	0.0	0	0.0
TEXAS	27	1,581	1	0.0	5	0.4	7	1.2	8	4.7	1	1.7	2	15.5	3	76.1
UTAH	0	0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
VERMONT	1	22	0	0.0	0	0.0	0	0.0	0	0.0	1	99.9	0	0.0	0	0.0
VIRGINIA	28	934	5	0.1	9	0.8	2	0.6	4	5.4	1	3.3	5	45.0	2	44.4
WASHINGTON	2	3	0	0.0	1	27.3	1	72.6	0	0.0	0	0.0	0	0.0	0	0.0
WEST VIRGINIA	14	73	0	0.0	4	4.9	3	11.2	7	83.8	0	0.0	0	0.0	0	0.0
WISCONSIN	3	11	0	0.0	1	8.2	1	21.9	1	69.8	0	0.0	0	0.0	0	0.0
WYOMING	0	0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
AMERICAN SAMOA	0	0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
GUAM	0	0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
N. MARIANAS	0	0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
PUERTO RICO	0	0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
PAC. TR. TERR.	0	0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
VIRGIN ISLANDS	0	0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
U.S. TOTALS	826	15,626	210	0.2	196	1.3	95	1.7	197	12.8	59	10.4	53	27.0	16	46.0

NOTES: 1. FLOW RANGE VALUES IN CUBIC METERS PER DAY X 1000. (APPROXIMATE MGD IN PARENTHESES).

2. TOTAL STATE FLOW IN CUBIC METERS PER DAY X 1000.

Table 35

Tertiary Treatment Facilities to be Built Between 1980 and 2000—By Total Projected Design Flow

Table 35 is a flow summary for all new tertiary treatment plants which will be constructed between 1980 and 2000. The treatment levels attained by tertiary plants are defined in terms of the effluent BOD concentration and/or the removal of nitrogen. A plant is considered to be tertiary in design if it is capable of consistently producing an effluent with a BOD concentration less than 10 mg/l; and/or, it has specific processes which can remove more than 50 percent of the total nitrogen present in the plant influent. A summary is provided for each State and U.S. Territory. National totals are summarized at the bottom of the table.

In the first column the total number of new tertiary treatment plants to be constructed in each State is reported along with the total wastewater treatment capacity represented by the plants. The Projected Design Flow for each plant was used to calculate the total treatment capacity value. The total State flows are reported in thousands of cubic meters per day.

Subsequent columns provide a breakdown of the State totals into seven flow ranges. The ranges are specified in the column headings and are reported in thousands of cubic meters per day and, in parentheses beneath that, in million gallons per day. Reported for each flow range are the number of plants in the range and the percentage of the State tertiary treatment capacity that is accounted for by each flow range.

Included in this summary are entirely new tertiary plants which are planned to be constructed by the year 2000. Excluded are tertiary plants that were operational in 1980; and primary, advanced primary, secondary, and advanced secondary plants planned to be upgraded to tertiary treatment by the year 2000.

			PLANTS AND PERCENT OF FLOW BY FLOW RANGE													
			0-.4 (0-.10)		.401-1.9 (.11-.50)		1.901-4 (.51-1.05)		4.001-19 (1.06-5.01)		19.001-40 (5.02-10.56)		40.001-190 (10.57-50.19)		190.001+ (50.2+)	
STATE	TOTAL PLANTS	TOTAL DESIGN FLOW	PLANTS	% FLOW	PLANTS	% FLOW	PLANTS	% FLOW	PLANTS	% FLOW	PLANTS	% FLOW	PLANTS	% FLOW	PLANTS	% FLOW
ALABAMA	0	0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
ALASKA	0	0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
ARIZONA	0	0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
ARKANSAS	5	1	4	36.1	1	63.8	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
CALIFORNIA	0	0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
COLORADO	1	30	0	0.0	0	0.0	0	0.0	0	0.0	1	99.9	0	0.0	0	0.0
CONNECTICUT	0	0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
DELAWARE	0	0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
DIST. OF COLUM.	0	0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
FLORIDA	4	120	0	0.0	0	0.0	0	0.0	2	26.8	0	0.0	2	73.1	0	0.0
GEORGIA	0	0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
HAWAII	0	0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
IDAHO	1	10	0	0.0	0	0.0	0	0.0	1	99.9	0	0.0	0	0.0	0	0.0
ILLINOIS	0	0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
INDIANA	0	0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
IOWA	0	0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
KANSAS	0	0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
KENTUCKY	1	0	0	0.0	1	99.9	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
LOUISIANA	2	23	0	0.0	1	3.0	0	0.0	0	0.0	1	96.9	0	0.0	0	0.0
MAINE	3	1	2	57.1	1	42.8	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
MARYLAND	1	90	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1	99.9	0	0.0
MASSACHUSETTS	2	56	0	0.0	0	0.0	1	4.1	0	0.0	0	0.0	1	95.8	0	0.0
MICHIGAN	1	0	1	99.9	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
MINNESOTA	0	0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
MISSISSIPPI	1	0	1	99.9	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
MISSOURI	3	0	2	39.9	1	59.9	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
MONTANA	0	0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
NEBRASKA	0	0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
NEVADA	0	0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
NEW HAMPSHIRE	4	23	1	1.4	0	0.0	1	16.8	2	81.6	0	0.0	0	0.0	0	0.0
NEW JERSEY	3	41	0	0.0	0	0.0	0	0.0	2	52.3	1	47.6	0	0.0	0	0.0
NEW MEXICO	0	0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
NEW YORK	50	101	23	4.5	20	18.3	1	2.9	5	40.7	1	33.4	0	0.0	0	0.0
NORTH CAROLINA	32	71	26	6.0	3	1.8	1	4.7	0	0.0	2	87.3	0	0.0	0	0.0
NORTH DAKOTA	0	0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
OHIO	40	62	25	8.7	8	13.1	4	20.3	3	57.7	0	0.0	0	0.0	0	0.0
OKLAHOMA	0	0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
OREGON	0	0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
PENNSYLVANIA	5	6	1	2.9	3	57.7	1	39.2	0	0.0	0	0.0	0	0.0	0	0.0
RHODE ISLAND	0	0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
SOUTH CAROLINA	3	0	2	47.8	1	52.1	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
SOUTH DAKOTA	0	0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
TENNESSEE	0	0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
TEXAS	1	2	0	0.0	0	0.0	1	99.9	0	0.0	0	0.0	0	0.0	0	0.0
UTAH	0	0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
VERMONT	0	0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
VIRGINIA	16	135	5	0.8	7	4.2	1	1.6	1	6.1	0	0.0	2	87.1	0	0.0
WASHINGTON	0	0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
WEST VIRGINIA	4	7	0	0.0	2	23.6	2	76.3	0	0.0	0	0.0	0	0.0	0	0.0
WISCONSIN	0	0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
WYOMING	0	0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
AMERICAN SAMOA	0	0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
GUAM	0	0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
N. MARIANAS	0	0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
PUERTO RICO	0	0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
PAC. TR. TERR.	0	0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
VIRGIN ISLANDS	0	0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
U.S. TOTALS	183	790	93	2.3	49	5.5	13	4.8	16	21.4	6	21.4	6	44.4	0	0.0

NOTES: 1. FLOW RANGE VALUES IN CUBIC METERS PER DAY X 1000. (APPROXIMATE MGD IN PARENTHESES).

2. TOTAL STATE FLOW IN CUBIC METERS PER DAY X 1000.

Table 36

Dollar Needs for Construction of New Tertiary Treatment Facilities—By Plant Size

(Thousands of 1980 Dollars)

Table 36 summarizes the projected costs, reported in January 1980 dollars, for the construction of new tertiary treatment plants to be built between 1980 and 2000. Table 36 is a direct extension of Table 35.

The summary indicates a total dollar need per State for new tertiary facilities. The State totals are broken down into dollar needs by flow range which encompasses a plant's projected design capacity.

			TOTAL PROJECTED DESIGN FLOW						
CUBIC METERS PER DAY X 1000: (MILLION GALLONS PER DAY)			0-.40 (0-.10)	.401-1.9 (.11-.50)	1.901-4.0 (.51-1.05)	4.001-19 (1.06-5.01)	19.001-40 (5.02-10.56)	40.001-190 (10.57-50.19)	190.001+ (50.2+)
STATE	# OF PLANTS	STATE NEEDS	NEEDS	NEEDS	NEEDS	NEEDS	NEEDS	NEEDS	NEEDS
ALABAMA	0	0	0	0	0	0	0	0	0
ALASKA	0	0	0	0	0	0	0	0	0
ARIZONA	0	0	0	0	0	0	0	0	0
ARKANSAS	5	1,553	1,109	444	0	0	0	0	0
CALIFORNIA	0	0	0	0	0	0	0	0	0
COLORADO	1	26,361	0	0	0	0	26,361	0	0
CONNECTICUT	0	0	0	0	0	0	0	0	0
DELAWARE	0	0	0	0	0	0	0	0	0
DIST. OF COLUM.	0	0	0	0	0	0	0	0	0
FLORIDA	4	75,711	0	0	0	23,438	0	52,273	0
GEORGIA	0	0	0	0	0	0	0	0	0
HAWAII	0	0	0	0	0	0	0	0	0
IDAHO	1	6,784	0	0	0	6,784	0	0	0
ILLINOIS	0	0	0	0	0	0	0	0	0
INDIANA	0	0	0	0	0	0	0	0	0
IOWA	0	0	0	0	0	0	0	0	0
KANSAS	0	0	0	0	0	0	0	0	0
KENTUCKY	1	1,000	0	1,000	0	0	0	0	0
LOUISIANA	2	10,700	0	562	0	0	10,138	0	0
MAINE	3	2,094	1,284	810	0	0	0	0	0
MARYLAND	1	0	0	0	0	0	0	0	0
MASSACHUSETTS	2	45,454	0	0	2,972	0	0	42,482	0
MICHIGAN	1	965	965	0	0	0	0	0	0
MINNESOTA	0	0	0	0	0	0	0	0	0
MISSISSIPPI	1	545	545	0	0	0	0	0	0
MISSOURI	3	2,126	539	1,587	0	0	0	0	0
MONTANA	0	0	0	0	0	0	0	0	0
NEBRASKA	0	0	0	0	0	0	0	0	0
NEVADA	0	0	0	0	0	0	0	0	0
NEW HAMPSHIRE	4	19,098	705	0	4,328	14,065	0	0	0
NEW JERSEY	3	51,545	0	0	0	21,613	29,932	0	0
NEW MEXICO	0	0	0	0	0	0	0	0	0
NEW YORK	50	60,800	9,222	18,020	4,736	28,822	0	0	0
NORTH CAROLINA	32	45,004	7,015	1,749	3,359	0	32,881	0	0
NORTH DAKOTA	0	0	0	0	0	0	0	0	0
OHIO	40	48,913	11,971	10,251	12,973	13,718	0	0	0
OKLAHOMA	0	0	0	0	0	0	0	0	0
OREGON	0	0	0	0	0	0	0	0	0
PENNSYLVANIA	5	7,475	522	4,742	2,211	0	0	0	0
RHODE ISLAND	0	0	0	0	0	0	0	0	0
SOUTH CAROLINA	3	1,021	610	411	0	0	0	0	0
SOUTH DAKOTA	0	0	0	0	0	0	0	0	0
TENNESSEE	0	0	0	0	0	0	0	0	0
TEXAS	1	1,618	0	0	1,618	0	0	0	0
UTAH	0	0	0	0	0	0	0	0	0
VERMONT	0	0	0	0	0	0	0	0	0
VIRGINIA	16	16,361	1,460	6,264	2,445	0	0	6,192	0
WASHINGTON	0	0	0	0	0	0	0	0	0
WEST VIRGINIA	4	8,466	0	7,506	960	0	0	0	0
WISCONSIN	0	0	0	0	0	0	0	0	0
WYOMING	0	0	0	0	0	0	0	0	0
AMERICAN SAMOA	0	0	0	0	0	0	0	0	0
GUAM	0	0	0	0	0	0	0	0	0
N. MARIANAS	0	0	0	0	0	0	0	0	0
PUERTO RICO	0	0	0	0	0	0	0	0	0
PAC. TR. TERR.	0	0	0	0	0	0	0	0	0
VIRGIN ISLANDS	0	0	0	0	0	0	0	0	0
U.S. TOTALS	183	433,594	35,947	53,346	35,602	108,440	99,312	100,947	0

Table 37

National Dollar Needs for Changes in Existing Treatment Plants

(Thousands of 1980 Dollars)

Table 37 summarizes the dollar needs for changes to treatment facilities which are in operation in 1980.

The table is divided into three sections. The first section details the planned changes and costs by present design level of treatment for all treatment facilities in operation in 1980. A detailed explanation of the changes is given in Table 3.

A considerable amount of needs are shown for plants with Other and No Change types of planned changes. A number of situations are covered by these categories. One common situation is a treatment plant which will require a capital expenditure, such as for a new sludge digestor, but the degree of treatment and hydraulic capacity will not be changed.

Sections two and three summarize the costs to upgrade, and enlarge and upgrade presently operating facilities from their current level of treatment to the level they are projected to be in 2000.

For example, from section one we see that 7,852 secondary treatment facilities are in operation currently. The dollar needs for these facilities between 1980 and 2000 are over $10 billion. In section two we note 1,067 of the 7,852 secondary treatment facilities in operation will be upgraded at a cost of $1.6 billion, and in section three we note 1,022 of the 7,852 will be enlarged and upgraded at a cost of $3.9 billion.

The actual number of sites being upgraded, and enlarged and upgraded from one level of treatment to another is summarized in Table 38.

			DOLLAR NEEDS BY TYPE OF PLANNED CHANGE							
TYPE	# OF PLANTS	TOTAL DOLLAR NEEDS	ENLARGE	UPGRADE	ENLARGE & UPGRADE	REPLACE	OTHFR	ABANDON	ABANDON, RETAIN SEWERS	NO CHANGE
RAW DISCHARGE	220	1,292,512	0	1,292,512	0	0	0	0	0	0
LESS THAN SECONDARY	3,343	8,014,797	7,815	2,735,802	3,941,941	1,279,572	2,064	0	1,378	46,225
SECONDARY	7,852	10,156,266	2,900,290	1,649,887	3,971,684	1,104,433	26,652	146,984	263,097	93,239
ADVANCED SECONDARY	2,443	6,050,207	1,295,965	824,501	2,890,923	69,837	0	177,429	753,339	38,213
TERTIARY	251	335,562	218,178	10,314	49,725	373	0	36,575	19,291	1,106
NO DISCHARGE	1,361	429,651	216,501	23,650	47,853	125,745	0	871	14,851	180
TOTAL	15,470	26,278,995	4,638,749	6,536,666	10,902,126	2,579,960	28,716	361,859	1,051,956	178,963

			DOLLAR NEEDS FOR PLANTS TO RF UPGRADED TO			
TYPE	# OF PLANTS	TOTAL DOLLAR NEEDS	SECONDARY	ADVANCED SECONDARY	TFRTIARY	NO DISCHARGE
RAW DISCHARGE	220	1,292,512	1,060,172	209,177	17,848	5,315
LESS THAN SECONDARY	1,205	2,735,802	2,129,638	551,327	47,606	7,231
SECONDARY	1,067	1,649,887	702,069	872,576	49,093	26,149
ADVANCED SECONDARY	256	824,501	0	574,385	249,891	225
TERTIARY	16	10,314	0	0	10,314	0
NO DISCHARGE	43	23,650	135	54	0	23,461
TOTAL	2,807	6,536,666	3,892,014	2,207,519	374,752	62,381

			DOLLAR NEEDS FOR PLANTS TO RE ENLARGFD AND UPGRADED TO			
TYPE	# OF PLANTS	TOTAL DOLLAR NEEDS	SECONDARY	ADVANCED SECONDARY	TFRTIARY	NO DISCHARGE
RAW DISCHANGE	0	0	0	0	0	0
LESS THAN SECONDARY	1,085	3,941,941	2,852,410	933,262	132,525	23,744
SECONDARY	1,022	3,971,684	342,307	3,257,862	343,741	27,774
ADVANCED SECONDARY	244	2,890,923	0	2,337,893	523,315	29,715
TERTIARY	11	49,725	0	0	49,725	0
NO DISCHARGE	39	47,853	3,680	14,789	0	29,384
TOTAL	2,401	10,902,126	3,198,397	6,543,806	1,049,306	110,617

Table 38

National Summary of Treatment Plant Upgrades for Plants Operating in 1980

Table 38 summarizes the upgrades, and enlargement and upgrades projected for facilities in operation in 1980.

The far left column gives the total number and total present design flow, by present level of treatment, of all the facilities that will undergo some type of upgrade between 1980 and 2000. The columns to the right show the situation after the upgrades, listing for each projected treatment level the number of facilities and the flow.

For example, 220 existing raw discharge facilities will be upgraded by the year 2000. The level to which each will be upgraded is listed to the right of the present total.

The costs involved to accomplish the various upgrades are summarized in Table 37.

All flows are reported in thousands of cubic meters per day.

		PROJECTED LEVEL OF TREATMENT FOR YEAR 2000			
PRESENT LEVEL OF TREATMENT	PRESENT TOTALS	NO DISCHARGE	SECONDARY	ADVANCED SECONDARY	TERTIARY
RAW DISCHARGE	220 SITES 181 KCMD	8 SITES 0 KCMD 0,1 % ROW 0,0 % COL 0,0 % ALL	175 SITES 157 KCMD 87,0 % ROW 0,6 % COL 0,2 % ALL	33 SITES 21 KCMD 11,7 % ROW 0,0 % COL 0,0 % ALL	4 SITES 2 KCMD 1,1 % ROW 0,0 % COL 0,0 % ALL
LESS THAN SECONDARY	2,290 SITES 22,900 KCMD	61 SITES 54 KCMD 0,2 % ROW 9,4 % COL 0,0 % ALL	1,638 SITES 16,988 KCMD 67,5 % ROW 74,1 % COL 22,8 % ALL	508 SITES 7,575 KCMD 30,1 % ROW 18,8 % COL 10,1 % ALL	83 SITES 525 KCMD 2,0 % ROW 4,8 % COL 0,7 % ALL
SECONDARY	2,088 SITES 18,427 KCMD	37 SITES 247 KCMD 1,0 % ROW 43,3 % COL 0,3 % ALL	558 SITES 5,760 KCMD 24,9 % ROW 25,1 % COL 7,7 % ALL	1,287 SITES 15,175 KCMD 65,8 % ROW 37,7 % COL 20,3 % ALL	206 SITES 1,875 KCMD 8,1 % ROW 17,3 % COL 2,5 % ALL
ADVANCED SECONDARY	500 SITES 21,025 KCMD	5 SITES 42 KCMD 0,1 % ROW 7,5 % COL 0,0 % ALL	0 SITES 0 KCMD 0,0 % ROW 0,0 % COL 0,0 % ALL	408 SITES 17,379 KCMD 69,8 % ROW 43,2 % COL 23,3 % ALL	87 SITES 7,471 KCMD 30,0 % ROW 69,2 % COL 10,0 % ALL
TERTIARY	27 SITES 661 KCMD	0 SITES 0 KCMD 0,0 % ROW 0,0 % COL 0,0 % ALL	0 SITES 0 KCMD 0,0 % ROW 0,0 % COL 0,0 % ALL	0 SITES 0 KCMD 0,0 % ROW 0,0 % COL 0,0 % ALL	27 SITES 909 KCMD 100,0 % ROW 8,4 % COL 1,2 % ALL
NO DISCHARGE	82 SITES 229 KCMD	54 SITES 226 KCMD 86,3 % ROW 39,6 % COL 0,3 % ALL	12 SITES 8 KCMD 3,1 % ROW 0,0 % COL 0,0 % ALL	16 SITES 27 KCMD 10,4 % ROW 0,0 % COL 0,0 % ALL	0 SITES 0 KCMD 0,0 % ROW 0,0 % COL 0,0 % ALL
TOTALS	5,207 SITES 63,424 KCMD	165 SITES 571 KCMD 0,7 % ROW 100,0 % COL 0,7 % ALL	2,383 SITES 22,915 KCMD 30,7 % ROW 100,0 % COL 30,7 % ALL	2,252 SITES 40,180 KCMD 53,9 % ROW 100,0 % COL 53,9 % ALL	407 SITES 10,784 KCMD 14,4 % ROW 100,0 % COL 14,4 % ALL

NOTES: 1, PERCENTAGES ARE FUNCTION OF FLOW IN ROW, COLUMN AND OVERALL(ALL),

2, FLOW VALUES ARE PROJECTED DESIGN FLOWS IN CUBIC METERS PER DAY X 1000 (KCMD),

Table 39

Analysis of Liquid Effluent Disposal

(Number of Responses)

Table 39 summarizes the methods utilized by municipal sewerage authorities to dispose of the liquid effluents generated by treatment works. The summary describes the current situation (1980) and the changes expected to occur. The changes expected at a treatment facility are reflected in the changes to the effluent disposal method. Below is a brief explanation of the disposal methods:

Outfall to Surface Waters—Direct discharge to a body of fresh water.

Ocean Outfall—Direct discharge to an ocean, estuary, or bay.

Holding Pond—Not a final disposal but an intermediate step in the disposal process. In general the holding pond is used for storing effluent when the final disposal method is periodic versus continuous in nature. Spray irrigation is an example.

Deepwell—Disposal of effluent by deepwell injection.

Groundwater Recharge—Disposal of effluent via deepwell or other methods in order to replenish a groundwater aquifer for the purpose of municipal, agricultural, or industrial reuse, or to control salt water intrusion or land subsidence.

Other Land Disposal—Disposal of effluent on public or private land for other than agricultural purposes. No effluent recovery is practiced. Examples: municipal golf course watering, highway right-of-way maintenance.

Recycling and Reuse—Direct reuse of effluent for purposes other than irrigation, for example, as cooling or quenching in an industrial process.

Septic Tank Field—Disposal of effluent to a septic tank and leachfield or cesspool.

Other—Any method of disposal not described elsewhere in this section.

No Discharge—No discharge to surface or groundwaters. Example: Complete retention in an evaporation lagoon.

Spray Irrigation—Reuse of treated effluent in agriculture by spraying.

Ditch Irrigation—Reuse of treated effluent in agriculture using a ditch, swale, or other surface flow method.

To Other WWT Plants—Direct transmission of treated effluent from a treatment plant or raw wastes from a collection system to another treatment facility for further treatment prior to final disposal.

The totals cannot be directly compared with other table summaries since many sewage treatment authorities have more than one method of effluent disposal in operation simultaneously. For example, treated effluent may be going to a holding pond and from there part may go to surface waters and part to spray irrigation. This use of multiple disposal methods prevents the development of a one to one correspondence between the number of treatment facilities and the number of effluent disposal methods.

UNITED STATES TOTAL	CURRENT STATUS		
		IN OPERATION	42,068
		UNDER CONSTRUCTION	604
		REQUIRED, BUT NOT YET APPROVED OR FUNDED	12,274

	Nature of Projected Change								
Disposal Method	Enlarge	Upgrade	Enlarge and Upgrade	New Construction	Replace	Abandon	No Change	Other	Total
OUTFALL TO SURFACE WATERS	401	313	376	6,983	238	2,108	10,256	60	20,735
OCEAN OUTFALL	11	1	3	180	26	48	215	0	484
HOLDING POND	40	6	7	663	10	71	1,016	4	1,817
DEEP WELL	2	0	0	16	1	6	12	0	37
GROUND WATER RECHARGE	3	2	2	41	3	25	115	1	192
OTHER LAND DISPOSAL	2	0	0	33	0	3	22	0	60
RECYCLING AND REUSE	4	1	0	57	0	8	43	0	113
SEPTIC TANK FIELD	2	1,647	5	56	5	15,230	4,448	1	21,394
OTHER	4	0	0	29	104	57	37	0	231
NO DISCHARGE	9	2	1	878	7	346	1,031	5	2,279
SPRAY IRRIGATION	21	2	2	394	1	27	413	0	860
DITCH IRRIGATION	1	3	3	83	0	6	292	1	389
TO OTHER WWT PLANTS	267	27	9	3,456	8	32	3,047	7	6,853
TOTAL	767	2,004	408	12,869	403	17,967	20,947	79	55,444

Table 40

Summary of Treatment and Sludge Handling Processes—Numbers of Plants and Associated Flow—United States Totals

Table 40 summarizes the inventory of unit processes that was compiled during the 1980 Survey. Items 1 through 64 refer to the liquid line, items 65 through 95 refer to the sludge line, and items 96 through AD list miscellaneous processes and types of controls. Table 41 expands the data available for each of the 112 items.

Three categories of information are developed for each item (unit process). For each process, information is provided as to whether a process is Now in Use, Under Construction, or Required But Not Yet Funded. In each category the total number of processes is listed along with an associated total flow. For processes Now In Use, the total flow was compiled using the Present Design Flow of the treatment facility using the process. For the Under Construction and Required But Not Yet Funded categories, the total flow was compiled using the Projected Design Flow.

A unit process is defined to mean the complete process. For instance, activated sludge includes the aeration basin, associated blowers and other integral mechanical equipment, and the secondary clarifier, which is not listed separately.

Multiple or parallel processes are counted as one process for any single facility. For example, if a facility has four aerobic digesters, the number of aerobic digesters counted in this summary is one, not four. Therefore, the Number column denotes the number of plants using that process.

TREATMENT PROCESSES	NOW IN USE		UNDER CONSTRUCTION		REQUIRED BUT NOT YET FUNDED	
	NUMBER	FLOW	NUMBER	FLOW	NUMBER	FLOW
1. PUMPING, RAW WASTEWATER	8,430	40,852	242	5,187	5,940	14,420
2. PRELIMINARY TREATMENT - RAW SCREEN	8,944	110,935	244	5,609	8,809	14,457
3. PRELIMINARY TREATMENT - GRIT REMOVAL	4,235	48,163	179	4,622	1,874	13,882
4. PRELIMINARY TREATMENT - COMMINUTORS	3,836	43,325	143	1,548	1,878	7,645
5. PRELIMINARY TREATMENT - OTHERS	75	2,593	1	0	10	16
6. SCUM REMOVAL	178	22,678	15	1,152	88	2,905
7. FLOW EQUALIZATION BASINS	413	10,928	41	596	452	10,779
8. PREAERATION	416	25,715	23	1,116	73	2,430
9. PRIMARY SEDIMENTATION	5,401	102,657	189	8,368	2,037	11,408
10. TRICKLING FILTER - ROCK MEDIA	2,487	20,841	32	673	63	1,650
11. TRICKLING FILTER - PLASTIC MEDIA	82	1,818	6	70	88	1,201
12. TRICKLING FILTER - REDWOOD SLATS	40	905	3	149	[illegible]	443
13. TRICKLING FILTER - OTHER MEDIA	12	322	2	57	4	447
14. ACTIVATED SLUDGE - CONVENTIONAL	2,917	75,601	155	[illegible]	1,573	17,737
15. ACTIVATED SLUDGE - HIGH RATE	40	3,881	3	862	16	374
16. ACTIVATED SLUDGE - CONTACT STABILIZATION	1,290	12,124	21	808	373	2,340
17. ACTIVATED SLUDGE - EXTENDED AERATION	1,977	5,665	108	278	1,938	2,851
18. PURE OXYGEN ACTIVATED SLUDGE	68	9,850	10	1,757	44	9,89
19. BIO-DISC (ROTATING BIOLOGICAL FILTERS)	179	1,910	55	462	368	3,28
20. OXIDATION DITCH USING MECHANICAL AERATORS	553	1,297	46	88	615	1,31
21. CLARIFICATION USING TUBE SETTLERS	42	414	5	86	16	17
22. SECONDARY CLARIFICATION	1,687	13,813	70	1,800	736	5,07
23. BIOLOGICAL NITRIFICATION - SEPARATE STAGE	151	3,279	44	1,954	555	14,77
24. BIOLOGICAL NITRIFICATION - ROD & NIT.	274	5,168	50	1,518	764	9,40
25. BIOLOGICAL DENITRIFICATION	28	498	5	100	58	1,43
26. POST AERATION (REAERATION)	541	8,550	43	2,457	721	5,53
27. MICROSTRAINERS - PRIMARY	28	2,518	3	18	21	13
28. MICROSTRAINERS - SECONDARY	75	2,315	15	242	40	56
29. SAND FILTERS	1,340	9,746	136	3,819	3,942	15,57
30. MIX-MEDIA FILTERS (SAND AND COAL)	230	8,328	28	1,851	248	7,60
31. OTHER FILTRATIONS	93	1,061	2	24	25	86
32. ACTIVATED CARBON - GRANULAR	21	1,175	5	368	15	1,40
33. ACTIVATED CARBON - POWDERED	5	361	0	0	5	32
34. TWO STAGE LIME TREATMENT OF RAW WASTEWATER	13	285	0	0	8	3
35. TWO STAGE TERTIARY LIME TREATMENT	17	295	5	138	14	23
36. SINGLE STAGE LIME TREATMENT OF RAW WASTEWATER	25	749	3	120	14	35
37. SINGLE STAGE TERTIARY LIME TREATMENT	53	1,605	17	1,988	62	1,79
38. RECARBONATION	26	1,162	6	10	20	1,25
39. NEUTRALIZATION	16	164	1	10	15	19
40. ALUM ADDITION TO PRIMARY	73	2,989	4	707	41	78
41. ALUM ADDITION TO SECONDARY	262	6,302	41	510	395	4,54
42. ALUM ADDITION TO SEPARATE STAGE TERTIARY	66	1,778	9	178	74	1,41
43. FERRI-CHLORIDE ADDITION TO PRIMARY	42	1,256	0	0	12	291
44. FERRI-CHLORIDE ADDITION TO SECONDARY	145	4,496	15	118	96	664
45. FERRI-CHLORIDE ADDITION TO SEPARATE STAGE TERTIARY	31	352	3	1,250	23	506
46. OTHER CHEMICAL ADDITIONS	89	4,214	6	1,305	30	550
47. ION EXCHANGE	2	204	0	0	5	47
48. BREAKPOINT CHLORINATION	10	203	4	223	15	398
49. AMONIA STRIPPING	8	302	0	0	6	53
50. DECHLORINATION	182	2,628	33	401	260	1,565
51. CHLORINATION FOR DISINFECTION	7,737	81,587	347	4,532	7,597	19,443
52. OZONATION FOR DISINFECTION	22	1,107	5	148	16	910
53. OTHER DISINFECTION	6	3,458	2	3	7	10
54. LAND TREATMENT OF PRIMARY EFFLUENT	77	82	1	2	24	39
55. LAND TREATMENT OF SECONDARY EFFLUENT (30/30)	496	2,975	11	84	463	2,803
56. LAND TREATMENT OF INTERMEDIATE EFFLUENT	169	343	2	11	100	176
57. STABILIZATION PONDS	5,665	12,609	91	226	3,464	2,429
58. AERATED LAGOONS	1,166	4,926	70	253	2,550	1,987
59. OUTFALL PUMPING	260	11,874	16	3,277	270	4,468
60. OUTFALL DIFFUSER	71	5,081	9	1,042	42	4,795
61. EFFLUENT TO OTHER PLANTS	12	231	2	10	16	451
62. EFFLUENT OUTFALL	12,636	109,896	206	3,110	6,883	12,164
63. OTHER TREATMENT	539	6,278	18	1,383	148	3,974
64. RECALCINATION	29	2,399	1	37	12	246
SLUDGE HANDLING METHODS						
65. AEROBIC DIGESTION - AIR	2,960	17,823	147	2,227	2,667	8,366
66. AEROBIC DIGESTION - OXYGEN	46	608	3	32	25	774
67. COMPOSTING	16	2,907	4	158	22	1,361
68. ANAEROBIC DIGESTION	4,296	78,701	138	4,417	1,092	8,345
69. SLUDGE LAGOONS	608	14,550	16	592	141	2,315
70. HEAT TREATMENT	163	12,999	9	3,035	40	4,004
71. CHLORINE OXIDATION OF SLUDGE (PURIFAX)	36	1,515	3	45	15	135
72. LIME STABILIZATION	65	3,011	7	132	32	588
73. WET AIR OXIDATION	51	3,172	3	98	2	266
74. AIR DRYING	6,688	49,724	177	830	3,661	8,863
75. DEWATERING - MECHANICAL - VACUUM FILTER	1,115	51,460	119	3,670	525	10,783
76. DEWATERING - MECHANICAL - CENTRIFUGE	209	12,931	21	772	62	9,513
77. DEWATERING - MECHANICAL - FILTER PRESS	102	3,657	9	2,664	118	5,053
78. DEWATERING - OTHERS	29	1,748	1	2	18	199
79. GRAVITY THICKENING	709	30,864	67	3,431	378	8,135
80. AIR FLOTATION THICKENING	199	15,020	19	1,627	122	9,322
81. INCINERATION - MULTIPLE HEARTH	306	26,599	24	2,270	78	7,924
82. INCINERATION - FLUIDIZED BEDS	19	1,269	1	22	2	265
83. INCINERATION - ROTARY KILN	8	236	0	0	0	0
84. INCINERATION - OTHERS	13	1,075	0	0	2	223
85. PYROLYSIS	2	97	0	0	4	121
86. CO-INCINERATION WITH SOLID WASTE	5	140	0	0	3	6
87. CO-PYROLYSIS WITH SOLID WASTE	6	14	0	0	3	276
88. CO-INCINERATION - OTHERS	0	0	0	0	0	0
89. LAND FILL	5,918	66,930	168	2,835	3,455	12,610
90. LAND SPREADING OF LIQUID SLUDGE	1,170	11,536	40	426	494	1,541
91. LAND SPREADING OF THICKENED SLUDGE	925	15,514	20	291	244	4,848
92. TRENCHING	8	1,247	1	7	1	0
93. OCEAN DUMPING	99	11,699	0	0	0	0
94. OTHER SLUDGE HANDLING	240	12,578	17	576	134	10,685
95. DIGEST GAS UTILIZATION FACILITIES	186	10,664	6	1,296	40	4,372
MISCELLANEOUS						
96. CONTROL/LAB,MAINTENANCE BUILDINGS	8,208	100,540	257	5,437	6,198	13,948
97. FULLY AUTOMATED USING DIGITAL CONTROL	90	6,463	3	1,930	26	2,711
98. FULLY AUTOMATED USING ANALOG CONTROLS	77	5,029	6	1,355	14	1,361
99. SEMI AUTOMATED PLANT	10,476	108,381	273	3,207	5,438	12,865
A1. MANUALLY OPERATED AND CONTROLLED PLANT	4,398	8,898	65	241	2,923	1,455
A2. PACKAGE PLANT	1,724	1,882	76	90	1,322	787
A3. SEMI-PACKAGE PLANT	1,905	6,608	59	173	1,843	1,796
A4. CUSTOM BUILT PLANT	11,291	119,459	219	8,218	5,092	12,781
A5. IMHOFF TANKS	318	327	0	0	4	3
A6. SEPTIC TANKS	98	13	5	1	38	12
A7. ELECTRODIALYSIS	0	0	0	0	0	0
A8. REVERSE OSMOSIS	0	0	0	0	1	37
A9. PRESSURE FILTERS	5	28	0	0	0	0
AA. SEEPAGE LAGOONS	321	78	36	15	205	72
AB. ROCK FILTERS	1	0	0	0	5	4
AC. POLYMER ADDITION TO LIQUID STREAM	9	754	9	81	81	299
AD. POLYMER ADDITION TO SLUDGE STREAM	8	908	7	80	91	808

Table 41

Projected Change in Treatment Process Use—Numbers of Plants and Associated Flow

(Flow in Thousands of Cubic Meters per Day)

Table 41 is a national summary of the number, the flow, and the projected change information collected pertaining to unit processes. Table 41 is an expansion of the summary presented in Table 40. Each unit process listed in Table 40 is presented in greater detail herein.

For easy reference the summaries are presented in the same sequence as in Table 40. For instance preaeration, item number 8 in Table 40, can be found under Table 41-8, the last number referring to the Table 40 item number.

Flows associated with each unit process are the sum of the total plant flows for all the facilities using that particular process. All flows are given in thousands of cubic meters per day. The Present Design flow was used for processes Now In Use. The Projected Design flow was used for processes Under Construction and Required But Not Yet Funded.

The information for each unit process is divided into two general categories, Type 1 and Type 2 estimates. Type 1 information was obtained from actual preliminary engineering designs. Type 2 information was generally developed using EPA cost estimating procedures together with commonly accepted treatment practices for the geographic area.

The Projected Change Codes are defined in the narrative accompanying Table 3.

	Process Total		Type 1 Estimate Now in Use		Under Construction		Required but Not Funded		Type 2 Estimate Now in Use		Under Construction		Required but Not Funded	
	Plants	Flow	Plants	Flow	Plants	Flow	Plants	Flow	Plants	Flow	Plants	Flow	Plants	Flow
41-1 PUMPING,RAW WASTEWATER														
ENLARGE	1,257	17,210	504	11,266	31	792	1	117	720	4,997	1	37	0	0
UPGRADE	218	4,130	135	3,826	5	15	1	0	77	287	0	0	0	0
ENLARGE AND UPGRADE	335	5,812	246	5,458	13	115	0	0	75	237	1	0	0	0
INSTALL IN NEW PLANT	4,170	15,576	0	0	192	1,211	908	10,923	0	0	1	68	3,069	3,377
REPLACE	322	2,795	178	2,362	9	161	0	0	133	260	1	9	1	0
ABANDON	799	7,564	790	6,783	4	757	0	0	5	23	0	0	0	0
NO CHANGE	3,579	55,335	2,917	49,611	3	15	0	0	658	5,707	1	1	0	0
OTHER	2	18	2	18	0	0	0	0	0	0	0	0	0	0
TOTAL	10,682	108,444	4,772	79,329	257	3,070	910	11,041	1,668	11,514	5	117	3,070	3,377
41-2 PRELIMINARY TREATMENT - BAR SCREEN														
ENLARGE	1,461	23,301	589	16,123	33	975	2	124	836	6,077	0	0	1	1
UPGRADE	283	4,217	160	2,967	6	789	0	0	117	460	0	0	0	0
ENLARGE AND UPGRADE	429	4,295	284	3,741	10	75	2	79	132	398	1	0	0	0
INSTALL IN NEW PLANT	7,033	15,747	1	2	228	1,477	1,305	9,403	2	1	2	68	5,495	4,801
REPLACE	451	5,190	217	2,908	13	1,941	1	0	219	334	1	9	0	0
ABANDON	1,091	4,921	1,085	4,915	1	0	0	0	5	5	0	0	0	0
NO CHANGE	5,342	72,985	4,345	64,426	3	8	1	4	991	8,551	1	1	1	19
OTHER	2	12	1	12	0	0	0	0	0	0	0	0	1	0
TOTAL	16,092	130,671	6,682	95,093	294	5,267	1,311	9,611	2,302	15,830	5	81	5,498	4,822

	Process Total		Type 1 Estimate Now in Use		Under Construction		Required but Not Funded		Type 2 Estimate Now in Use		Under Construction		Required but Not Funded	
	Plants	Flow	Plants	Flow	Plants	Flow	Plants	Flow	Plants	Flow	Plants	Flow	Plants	Flow
41-3 PRELIMINARY TREATMENT - GRIT REMOVAL														
ENLARGE	755	17,624	353	13,038	23	516	0	0	378	4,038	1	37	0	0
UPGRADE	142	3,492	89	3,087	1	0	1	15	51	389	0	0	0	0
ENLARGE AND UPGRADE	267	6,559	200	3,582	12	2,690	0	0	55	286	0	0	0	0
INSTALL IN NEW PLANT	2,006	15,508	2	18	139	1,152	745	11,056	3	405	3	83	1,123	2,793
REPLACE	198	3,332	115	3,028	6	79	0	0	77	225	0	0	0	0
ABANDON	426	3,416	409	3,403	1	0	0	0	16	16	0	0	0	0
NO CHANGE	2,490	62,643	2,114	55,296	1	42	3	14	371	7,269	1	21	0	0
OTHER	4	77	2	76	0	0	0	0	0	0	0	0	2	0
TOTAL	6,288	112,659	3,284	81,528	179	4,480	749	11,086	951	12,630	5	142	1,125	2,794
41-4 PRELIMINARY TREATMENT - COMMINUTORS														
ENLARGE	596	7,404	265	4,460	15	357	0	0	315	2,549	1	37	0	0
UPGRADE	146	1,059	80	828	0	0	2	5	64	226	0	0	0	0
ENLARGE AND UPGRADE	262	2,831	177	2,217	8	74	0	0	77	539	0	0	0	0
INSTALL IN NEW PLANT	1,986	8,549	3	38	112	939	673	5,258	0	0	0	0	1,198	2,314
REPLACE	142	890	101	636	6	49	0	0	35	204	0	0	0	0
ABANDON	414	2,466	409	2,462	0	0	0	0	5	3	0	0	0	0
NO CHANGE	2,371	29,796	2,010	26,965	1	39	2	4	358	2,787	0	0	0	0
OTHER	3	62	0	0	0	0	2	62	0	0	0	0	1	0
TOTAL	5,920	53,061	3,045	37,609	142	1,460	679	5,330	854	6,311	1	37	1,199	2,314
41-5 PRELIMINARY TREATMENT - OTHERS														
ENLARGE	5	83	0	0	0	0	0	0	5	83	0	0	0	0
UPGRADE	1	18	1	18	0	0	0	0	0	0	0	0	0	0
ENLARGE AND UPGRADE	3	5	3	5	0	0	0	0	0	0	0	0	0	0
INSTALL IN NEW PLANT	11	22	0	0	1	4	9	17	0	0	0	0	1	0
REPLACE	3	763	3	763	0	0	0	0	0	0	0	0	0	0
ABANDON	24	85	12	61	0	0	0	0	12	24	0	0	0	0
NO CHANGE	39	1,634	31	1,586	0	0	0	0	8	48	0	0	0	0
OTHER	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	86	2,615	50	2,435	1	4	9	17	25	157	0	0	1	0
41-6 SCUM REMOVAL														
ENLARGE	81	2,039	35	1,538	1	15	0	0	44	488	1	37	0	0
UPGRADE	14	7,985	12	7,983	0	0	0	0	2	1	0	0	0	0
ENLARGE AND UPGRADE	12	822	5	777	1	26	0	0	6	18	0	0	0	0
INSTALL IN NEW PLANT	76	3,927	0	0	10	1,021	39	2,826	0	0	0	0	27	79
REPLACE	3	32	0	0	2	31	0	0	1	0	0	0	0	0
ABANDON	38	630	37	630	0	0	0	0	1	0	0	0	0	0
NO CHANGE	235	11,273	198	8,806	0	0	0	0	37	2,467	0	0	0	0
OTHER	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	459	26,712	287	19,736	14	1,095	39	2,826	91	2,937	1	37	27	79
41-7 FLOW EQUALIZATION BASINS														
ENLARGE	71	1,827	34	1,339	1	68	0	0	36	420	0	0	0	0
UPGRADE	7	128	6	126	0	0	0	0	1	2	0	0	0	0
ENLARGE AND UPGRADE	7	674	5	667	0	0	0	0	2	6	0	0	0	0
INSTALL IN NEW PLANT	492	11,307	0	0	38	453	298	9,874	0	0	2	74	154	905
REPLACE	5	19	5	19	0	0	0	0	0	0	0	0	0	0
ABANDON	26	137	26	137	0	0	0	0	0	0	0	0	0	0
NO CHANGE	298	8,209	270	7,345	0	0	0	0	28	864	0	0	0	0
OTHER	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	906	22,303	346	9,634	39	521	298	9,874	67	1,294	2	74	154	905
41-8 PREAERATION														
ENLARGE	64	4,256	33	2,758	3	278	0	0	28	1,222	0	0	0	0
UPGRADE	24	558	14	332	0	0	0	0	10	225	0	0	0	0
ENLARGE AND UPGRADE	24	286	19	270	0	0	0	0	5	16	0	0	0	0
INSTALL IN NEW PLANT	91	3,146	0	0	17	646	68	2,247	0	0	1	68	5	182
REPLACE	11	834	4	670	2	121	0	0	5	42	0	0	0	0
ABANDON	48	2,351	44	2,346	0	0	0	0	4	5	0	0	0	0
NO CHANGE	249	15,823	217	14,878	0	0	0	0	32	945	0	0	0	0
OTHER	1	4	1	4	0	0	0	0	0	0	0	0	0	0
TOTAL	512	27,261	332	21,256	22	1,048	68	2,247	84	2,458	1	68	5	182
41-9 PRIMARY SEDIMENTATION														
ENLARGE	927	18,184	451	12,828	19	557	1	117	454	4,643	1	37	1	1
UPGRADE	334	7,310	201	6,440	6	13	0	0	125	840	0	0	2	15
ENLARGE AND UPGRADE	453	13,610	314	10,722	23	2,021	0	0	116	867	0	0	0	0
INSTALL IN NEW PLANT	2,550	12,577	1	2	120	1,242	525	8,271	0	0	1	68	1,903	2,997
REPLACE	187	3,696	133	3,346	14	299	0	0	39	41	1	9	0	0
ABANDON	999	4,882	893	4,402	1	0	3	0	102	481	0	0	0	0
NO CHANGE	2,468	57,982	2,078	51,275	3	97	0	0	387	6,608	0	0	0	0
OTHER	9	155	6	139	0	0	1	4	1	11	0	0	1	0
TOTAL	7,927	118,401	4,077	89,156	186	4,231	530	8,393	1,224	13,495	3	115	1,907	3,014

47<

	Process Total		Type 1 Estimate Now in Use		Under Construction		Required but Not Funded		Type 2 Estimate Now in Use		Under Construction		Required but Not Funded	
	Plants	Flow	Plants	Flow	Plants	Flow	Plants	Flow	Plants	Flow	Plants	Flow	Plants	Flow	Plants	Flow
41-10 TRICKLING FILTER - ROCK MEDIA																
ENLARGE	193	1,943	90	1,181	3	76	0	0	100	685	0	0	0	0
UPGRADE	322	3,255	180	1,991	8	22	1	794	133	446	0	0	0	0
ENLARGE AND UPGRADE	210	1,203	134	882	5	122	0	0	71	198	0	0	0	0
INSTALL IN NEW PLANT	75	1,099	0	0	13	235	33	789	0	0	0	0	29	75
REPLACE	111	685	71	548	3	16	0	0	37	119	0	0	0	0
ABANDON	960	4,299	762	3,553	0	0	0	0	198	746	0	0	0	0
NO CHANGE	862	10,441	730	8,378	0	0	0	0	132	2,064	0	0	0	0
OTHER	9	44	8	33	0	0	0	0	1	11	0	0	0	0
TOTAL	2,742	22,973	1,975	16,568	32	473	34	1,584	672	4,272	0	0	29	75
41-11 TRICKLING FILTER - PLASTIC MEDIA																
ENLARGE	8	145	6	118	1	3	0	0	1	23	0	0	0	0
UPGRADE	2	13	2	13	0	0	0	0	0	0	0	0	0	0
ENLARGE AND UPGRADE	3	5	1	0	0	0	0	0	2	4	0	0	0	0
INSTALL IN NEW PLANT	53	1,277	0	0	5	75	45	1,196	0	0	0	0	3	5
REPLACE	1	0	1	0	0	0	0	0	0	0	0	0	0	0
ABANDON	6	17	4	13	0	0	0	0	2	4	0	0	0	0
NO CHANGE	43	1,638	41	1,606	0	0	0	0	2	32	0	0	0	0
OTHER	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	116	3,097	55	1,752	6	79	45	1,196	7	64	0	0	3	5
41-12 TRICKLING FILTER - REDWOOD SLATS																
ENLARGE	4	41	2	19	0	0	0	0	2	22	0	0	0	0
UPGRADE	1	22	1	22	0	0	0	0	0	0	0	0	0	0
ENLARGE AND UPGRADE	1	1	0	0	0	0	0	0	1	1	0	0	0	0
INSTALL IN NEW PLANT	20	593	0	0	3	81	15	443	0	0	1	68	1	0
REPLACE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ABANDON	5	151	4	151	0	0	0	0	1	0	0	0	0	0
NO CHANGE	29	687	28	645	0	0	0	0	1	41	0	0	0	0
OTHER	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	60	1,498	35	839	3	81	15	443	5	65	1	68	1	0
41-13 TRICKLING FILTER - OTHER MEDIA																
ENLARGE	1	4	1	4	0	0	0	0	0	0	0	0	0	0
UPGRADE	1	18	1	18	0	0	0	0	0	0	0	0	0	0
ENLARGE AND UPGRADE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
INSTALL IN NEW PLANT	6	554	0	0	2	57	2	438	0	0	0	0	2	59
REPLACE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ABANDON	3	7	3	7	0	0	0	0	0	0	0	0	0	0
NO CHANGE	7	291	7	291	0	0	0	0	0	0	0	0	0	0
OTHER	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	15	877	12	322	2	57	2	438	0	0	0	0	2	59
41-14 ACTIVATED SLUDGE - CONVENTIONAL																
ENLARGE	518	12,850	221	8,255	7	330	0	0	288	4,228	1	37	1	0
UPGRADE	185	10,544	107	8,984	0	0	1	2	76	1,550	0	0	1	7
ENLARGE AND UPGRADE	243	8,188	149	6,265	6	979	0	0	88	943	0	0	0	0
INSTALL IN NEW PLANT	1,700	21,611	3	5	131	3,666	567	13,690	0	0	3	280	996	3,970
REPLACE	58	4,258	39	4,122	6	87	0	0	13	49	0	0	0	0
ABANDON	465	3,711	438	3,620	0	0	2	0	25	90	0	0	0	0
NO CHANGE	1,469	36,828	1,300	33,525	1	0	2	7	166	3,295	0	0	0	0
OTHER	7	119	3	16	0	0	1	56	1	45	0	0	2	0
TOTAL	4,645	98,113	2,260	64,795	151	5,063	573	13,756	657	10,202	4	317	1,000	3,979
41-15 ACTIVATED SLUDGE - HIGH RATE																
ENLARGE	8	335	5	249	0	0	0	0	3	85	0	0	0	0
UPGRADE	2	475	1	416	0	0	0	0	1	58	0	0	0	0
ENLARGE AND UPGRADE	6	904	3	878	0	0	0	0	3	25	0	0	0	0
INSTALL IN NEW PLANT	19	1,237	0	0	3	862	12	220	0	0	0	0	4	154
REPLACE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ABANDON	2	3	2	3	0	0	0	0	0	0	0	0	0	0
NO CHANGE	22	1,963	20	1,950	0	0	0	0	2	13	0	0	0	0
OTHER	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	59	4,918	31	3,497	3	862	12	220	9	183	0	0	4	154
41-16 ACTIVATED SLUDGE - CONTACT STABILIZATION																
ENLARGE	228	4,617	64	3,699	4	245	0	0	160	673	0	0	0	0
UPGRADE	87	485	39	286	2	98	0	0	46	100	0	0	0	0
ENLARGE AND UPGRADE	84	980	42	776	0	0	0	0	42	203	0	0	0	0
INSTALL IN NEW PLANT	389	2,480	1	19	15	120	104	1,467	0	0	0	0	269	872
REPLACE	29	154	17	127	0	0	0	0	12	27	0	0	0	0
ABANDON	177	727	170	711	0	0	0	0	7	15	0	0	0	0
NO CHANGE	646	5,477	600	5,266	0	0	0	0	46	211	0	0	0	0
OTHER	2	4	1	4	0	0	0	0	1	0	0	0	0	0
TOTAL	1,642	14,928	934	10,890	21	464	104	1,467	314	1,233	0	0	269	872

	Process Total		Type 1 Estimate Now in Use		Under Construction		Required but Not Funded		Type 2 Estimate Now in Use		Under Construction		Required but Not Funded	
	Plants	Flow	Plants	Flow	Plants	Flow	Plants	Flow	Plants	Flow	Plants	Flow	Plants	Flow
41-17 ACTIVATED SLUDGE - EXTENDED AERATION														
ENLARGE	264	746	65	296	4	29	0	0	195	421	0	0	0	0
UPGRADE	125	325	51	247	0	0	1	1	73	76	0	0	0	0
ENLARGE AND UPGRADE	116	549	53	457	3	23	0	0	59	67	0	0	1	1
INSTALL IN NEW PLANT	2,034	3,073	0	0	99	225	491	1,438	0	0	0	0	1,444	1,409
REPLACE	17	11	15	8	0	0	0	0	2	2	0	0	0	0
ABANDON	343	499	324	487	1	0	0	0	18	11	0	0	0	0
NO CHANGE	1,123	3,569	1,023	3,449	1	0	0	0	98	119	0	0	1	0
OTHER	1	18	1	18	0	0	0	0	0	0	0	0	0	0
TOTAL	4,023	8,794	1,532	4,965	108	278	492	1,439	445	699	0	0	1,446	1,411
41-18 PURE OXYGEN ACTIVATED SLUDGE														
ENLARGE	12	1,220	9	1,113	0	0	0	0	3	106	0	0	0	0
UPGRADE	3	123	2	85	0	0	0	0	1	37	0	0	0	0
ENLARGE AND UPGRADE	6	3,916	6	3,916	0	0	0	0	0	0	0	0	0	0
INSTALL IN NEW PLANT	54	11,648	0	0	10	1,757	42	8,755	0	0	0	0	2	1,135
REPLACE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ABANDON	5	109	5	109	0	0	0	0	0	0	0	0	0	0
NO CHANGE	42	4,281	41	4,149	0	0	0	0	1	132	0	0	0	0
OTHER	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	122	21,299	63	9,373	10	1,757	42	8,755	5	276	0	0	2	1,135
41-19 BIO-DISC (ROTATING BIOLOGICAL FILTER)														
ENLARGE	15	225	9	154	0	0	0	0	5	55	0	0	1	15
UPGRADE	3	12	2	1	0	0	1	11	0	0	0	0	0	0
ENLARGE AND UPGRADE	2	21	1	1	0	0	0	0	1	20	0	0	0	0
INSTALL IN NEW PLANT	421	3,723	0	0	55	462	338	3,123	0	0	0	0	28	137
REPLACE	1	1	1	1	0	0	0	0	0	0	0	0	0	0
ABANDON	4	37	4	37	0	0	0	0	0	0	0	0	0	0
NO CHANGE	156	1,639	154	1,636	0	0	0	0	2	2	0	0	0	0
OTHER	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	602	5,661	171	1,832	55	462	339	3,134	8	78	0	0	29	153
41-20 OXIDATION DITCH USING MECHANICAL AERATORS														
ENLARGE	104	249	17	73	0	0	0	0	87	175	0	0	0	0
UPGRADE	21	54	10	35	0	0	0	0	11	18	0	0	0	0
ENLARGE AND UPGRADE	8	14	4	3	0	0	0	0	4	11	0	0	0	0
INSTALL IN NEW PLANT	661	1,396	0	0	46	84	335	1,030	0	0	0	0	280	281
REPLACE	4	1	2	0	0	0	0	0	2	1	0	0	0	0
ABANDON	18	33	10	25	0	0	0	0	8	7	0	0	0	0
NO CHANGE	397	941	378	908	0	0	0	0	19	32	0	0	0	0
OTHER	1	2	0	0	0	0	0	0	1	2	0	0	0	0
TOTAL	1,214	2,693	421	1,047	46	84	335	1,030	132	249	0	0	280	281
41-21 CLARIFICATION USING TUBE SETTLERS														
ENLARGE	10	46	5	12	1	3	0	0	4	30	0	0	0	0
UPGRADE	1	7	1	7	0	0	0	0	0	0	0	0	0	0
ENLARGE AND UPGRADE	5	64	3	30	1	26	0	0	1	7	0	0	0	0
INSTALL IN NEW PLANT	19	232	0	0	3	55	12	175	0	0	0	0	0	0
REPLACE	0	0	0	0	0	0	0	0	0	0	0	0	4	0
ABANDON	4	14	4	14	0	0	0	0	0	0	0	0	0	0
NO CHANGE	24	311	20	201	0	0	0	0	4	109	0	0	0	0
OTHER	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	63	677	33	267	5	86	12	175	9	147	0	0	4	0
41-22 SECONDARY CLARIFICATION														
ENLARGE	228	1,906	79	1,120	1	0	0	0	148	785	0	0	0	0
UPGRADE	108	752	61	667	1	0	0	0	46	84	0	0	0	0
ENLARGE AND UPGRADE	134	1,010	82	792	4	106	2	7	46	105	0	0	0	0
INSTALL IN NEW PLANT	796	5,907	3	6	59	765	402	4,052	0	0	1	68	331	1,014
REPLACE	88	253	60	170	1	30	0	0	27	52	0	0	0	0
ABANDON	232	987	179	682	0	0	0	0	53	305	0	0	0	0
NO CHANGE	862	9,039	774	7,558	3	29	0	0	85	1,452	0	0	0	0
OTHER	5	30	3	17	0	0	1	1	1	11	0	0	0	0
TOTAL	2,453	19,888	1,241	11,016	69	932	405	4,061	406	2,795	1	68	331	1,014
41-23 BIOLOGICAL NITRIFICATION - SEPARATE STAGE														
ENLARGE	22	992	10	170	0	0	0	0	12	822	0	0	0	0
UPGRADE	2	85	1	85	0	0	0	0	1	0	0	0	0	0
ENLARGE AND UPGRADE	4	152	4	152	0	0	0	0	0	0	0	0	0	0
INSTALL IN NEW PLANT	597	16,725	0	0	43	1,954	275	11,422	0	0	0	0	279	3,349
REPLACE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ABANDON	13	78	11	78	1	0	1	0	0	0	0	0	0	0
NO CHANGE	112	1,970	111	1,961	0	0	0	0	1	9	0	0	0	0
OTHER	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	750	20,005	137	2,447	44	1,954	276	11,422	14	832	0	0	279	3,349

	Process Total		Type 1 Estimate Now in Use		Under Construction		Required but Not Funded		Type 2 Estimate Now in Use		Under Construction		Required but Not Funded	
	Plants	Flow	Plants	Flow	Plants	Flow	Plants	Flow	Plants	Flow	Plants	Flow	Plants	Flow
41-24 BIOLOGICAL NITRIFICATION - BOD & NIT														
ENLARGE	44	861	16	336	0	0	0	0	28	524	0	0	0	0
UPGRADE	6	475	3	9	0	0	0	0	3	465	0	0	0	0
ENLARGE AND UPGRADE	1	227	1	227	0	0	0	0	0	0	0	0	0	0
INSTALL IN NEW PLANT	814	10,925	1	3	49	1,517	270	7,390	0	0	0	0	494	2,014
REPLACE	3	10	0	0	0	0	0	0	3	10	0	0	0	0
ABANDON	8	9	7	7	0	0	0	0	1	2	0	0	0	0
NO CHANGE	212	3,580	205	3,525	1	0	0	0	6	54	0	0	0	0
OTHER	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	1,088	16,091	233	4,110	50	1,518	270	7,390	41	1,057	0	0	494	2,014
41-25 BIOLOGICAL DENITRIFICATION														
ENLARGE	2	10	0	0	0	0	0	0	2	10	0	0	0	0
UPGRADE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ENLARGE AND UPGRADE	1	6	1	6	0	0	0	0	0	0	0	0	0	0
INSTALL IN NEW PLANT	62	862	0	0	5	100	26	536	0	0	0	0	31	225
REPLACE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ABANDON	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NO CHANGE	21	481	19	440	0	0	0	0	2	41	0	0	0	0
OTHER	1	1,169	0	0	0	0	1	1,169	0	0	0	0	0	0
TOTAL	87	2,530	20	447	5	100	27	1,705	4	51	0	0	31	225
41-26 POST AERATION (REAERATION)														
ENLARGE	57	1,114	28	335	0	0	0	0	29	779	0	0	0	0
UPGRADE	12	15	6	9	0	0	1	1	4	3	0	0	1	0
ENLARGE AND UPGRADE	10	171	6	155	0	0	0	0	4	16	0	0	0	0
INSTALL IN NEW PLANT	808	7,948	1	1	86	2,333	465	4,875	0	0	2	83	254	655
REPLACE	8	50	2	6	4	40	0	0	2	3	0	0	0	0
ABANDON	61	253	59	247	1	0	0	0	1	6	0	0	0	0
NO CHANGE	419	6,986	364	6,063	0	0	0	0	55	923	0	0	0	0
OTHER	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	1,375	16,541	466	6,818	91	2,373	466	4,877	95	1,732	2	83	255	656
41-27 MICROSTRAINERS - PRIMARY														
ENLARGE	6	226	4	221	0	0	0	0	2	4	0	0	0	0
UPGRADE	1	77	0	0	0	0	0	0	1	77	0	0	0	0
ENLARGE AND UPGRADE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
INSTALL IN NEW PLANT	24	155	0	0	3	18	20	135	0	0	0	0	1	1
REPLACE	1	264	0	0	0	0	0	0	1	264	0	0	0	0
ABANDON	4	7	4	7	0	0	0	0	0	0	0	0	0	0
NO CHANGE	16	1,938	14	1,935	0	0	0	0	2	2	0	0	0	0
OTHER	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	52	2,670	22	2,165	3	18	20	135	6	348	0	0	1	1
41-28 MICROSTRAINERS - SECONDARY														
ENLARGE	10	159	5	117	0	0	0	0	4	40	1	0	0	0
UPGRADE	3	16	0	0	0	0	0	0	3	16	0	0	0	0
ENLARGE AND UPGRADE	2	4	1	1	0	0	0	0	1	3	0	0	0	0
INSTALL IN NEW PLANT	54	806	0	0	13	227	26	293	0	0	1	13	14	272
REPLACE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ABANDON	8	1,291	8	1,291	0	0	0	0	0	0	0	0	0	0
NO CHANGE	53	844	51	828	0	0	0	0	2	15	0	0	0	0
OTHER	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	130	3,122	65	2,239	13	227	26	293	10	76	2	14	14	272
41-29 SAND FILTERS														
ENLARGE	132	1,795	54	1,028	2	19	0	0	75	536	1	211	0	0
UPGRADE	28	129	14	70	0	0	1	0	11	54	0	0	2	3
ENLARGE AND UPGRADE	29	466	19	442	1	1	0	0	9	22	0	0	0	0
INSTALL IN NEW PLANT	4,064	19,121	1	0	127	3,309	1,040	10,272	0	0	1	264	2,895	5,277
REPLACE	12	146	10	144	0	0	0	0	2	1	0	0	0	0
ABANDON	156	267	148	262	2	0	1	0	5	4	0	0	0	0
NO CHANGE	994	7,189	800	6,952	1	5	0	0	192	224	1	7	0	0
OTHER	3	22	0	0	0	0	3	22	0	0	0	0	0	0
TOTAL	5,418	29,138	1,046	8,902	133	3,335	1,045	10,295	294	843	3	483	2,897	5,281
41-30 MIX-MEDIA FILTERS (SAND AND COAL)														
ENLARGE	37	1,674	14	897	0	0	0	0	23	776	0	0	0	0
UPGRADE	3	228	2	228	0	0	0	0	1	0	0	0	0	0
ENLARGE AND UPGRADE	2	425	1	378	0	0	0	0	1	47	0	0	0	0
INSTALL IN NEW PLANT	276	9,455	0	0	28	1,851	184	7,106	0	0	0	0	64	497
REPLACE	1	3	1	3	0	0	0	0	0	0	0	0	0	0
ABANDON	15	83	15	83	0	0	0	0	0	0	0	0	0	0
NO CHANGE	172	5,912	163	4,935	0	0	0	0	9	977	0	0	0	0
OTHER	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	506	17,783	196	6,527	28	1,851	184	7,106	34	1,801	0	0	64	497

	Process Total		Type 1 Estimate Now in Use		Under Construction		Required but Not Funded		Type 2 Estimate Now in Use		Under Construction		Required but Not Funded	
	Plants	Flow	Plants	Flow	Plants	Flow	Plants	Flow	Plants	Flow	Plants	Flow	Plants	Flow
41-31 OTHER FILTRATIONS														
ENLARGE	6	569	2	1	0	0	0	0	4	567	0	0	0	0
UPGRADE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ENLARGE AND UPGRADE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
INSTALL IN NEW PLANT	27	893	0	0	2	24	22	860	0	0	0	0	3	8
REPLACE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ABANDON	8	14	5	12	0	0	0	0	3	1	0	0	0	0
NO CHANGE	29	477	27	399	0	0	0	0	2	77	0	0	0	0
OTHER	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	70	1,954	34	414	2	24	22	860	9	646	0	0	3	8
41-32 ACTIVATED CARBON - GRANULAR														
ENLARGE	3	213	1	2	0	0	0	0	1	0	1	211	0	0
UPGRADE	1	37	0	0	0	0	0	0	1	37	0	0	0	0
ENLARGE AND UPGRADE	1	28	1	28	0	0	0	0	0	0	0	0	0	0
INSTALL IN NEW PLANT	19	1,541	0	0	4	137	12	1,394	0	0	0	0	3	9
REPLACE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ABANDON	1	0	1	0	0	0	0	0	0	0	0	0	0	0
NO CHANGE	16	1,106	15	728	0	0	0	0	1	378	0	0	0	0
OTHER	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	41	2,928	18	759	4	137	12	1,394	3	416	1	211	3	9
41-33 ACTIVATED CARBON - POWDERED														
ENLARGE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
UPGRADE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ENLARGE AND UPGRADE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
INSTALL IN NEW PLANT	5	325	0	0	0	0	4	277	0	0	0	0	1	47
REPLACE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ABANDON	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NO CHANGE	5	341	5	341	0	0	0	0	0	0	0	0	0	0
OTHER	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	10	666	5	341	0	0	4	277	0	0	0	0	1	47
41-34 TWO STAGE LIME TREATMENT OF RAW WASTEWATER														
ENLARGE	3	16	2	15	0	0	0	0	1	0	0	0	0	0
UPGRADE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ENLARGE AND UPGRADE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
INSTALL IN NEW PLANT	8	33	0	0	0	0	2	8	0	0	0	0	6	25
REPLACE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ABANDON	2	14	2	14	0	0	0	0	0	0	0	0	0	0
NO CHANGE	8	255	8	255	0	0	0	0	0	0	0	0	0	0
OTHER	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	21	318	12	285	0	0	2	8	1	0	0	0	6	25
41-35 TWO STAGE TERTIARY LIME TREATMENT														
ENLARGE	4	64	3	45	0	0	0	0	1	19	0	0	0	0
UPGRADE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ENLARGE AND UPGRADE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
INSTALL IN NEW PLANT	19	376	0	0	5	138	8	187	0	0	0	0	6	50
REPLACE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ABANDON	3	3	2	2	0	0	0	0	1	0	0	0	0	0
NO CHANGE	10	227	10	227	0	0	0	0	0	0	0	0	0	0
OTHER	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	36	672	15	275	5	138	8	187	2	19	0	0	6	50
41-36 SINGLE STAGE LIME TREATMENT OF RAW WASTEWATER														
ENLARGE	2	3	2	3	0	0	0	0	0	0	0	0	0	0
UPGRADE	1	113	1	113	0	0	0	0	0	0	0	0	0	0
ENLARGE AND UPGRADE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
INSTALL IN NEW PLANT	17	477	0	0	3	120	12	337	0	0	0	0	2	20
REPLACE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ABANDON	2	4	2	4	0	0	0	0	0	0	0	0	0	0
NO CHANGE	20	628	19	628	0	0	0	0	1	0	0	0	0	0
OTHER	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	42	1,227	24	749	3	120	12	337	1	0	0	0	2	20
41-37 SINGLE STAGE TERTIARY LIME TREATMENT														
ENLARGE	10	384	2	138	0	0	0	0	8	245	0	0	0	0
UPGRADE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ENLARGE AND UPGRADE	1	15	1	15	0	0	0	0	0	0	0	0	0	0
INSTALL IN NEW PLANT	79	3,779	0	0	17	1,988	32	1,296	0	0	0	0	30	495
REPLACE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ABANDON	1	5	1	5	0	0	0	0	0	0	0	0	0	0
NO CHANGE	41	1,200	39	1,094	0	0	0	0	2	105	0	0	0	0
OTHER	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	132	5,385	43	1,253	17	1,988	32	1,296	10	351	0	0	30	495

51<

	Process Total		Type 1 Estimate						Type 2 Estimate					
			Now in Use		Under Construction		Required but Not Funded		Now in Use		Under Construction		Required but Not Funded	
	Plants	Flow	Plants	Flow	Plants	Flow	Plants	Flow	Plants	Flow	Plants	Flow	Plants	Flow
41-38 RECARBONATION														
ENLARGE	2	19	0	0	0	0	0	0	2	19	0	0	0	0
UPGRADE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ENLARGE AND UPGRADE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
INSTALL IN NEW PLANT	25	1,270	0	0	5	10	8	950	0	0	0	0	12	309
REPLACE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ABANDON	3	6	1	5	1	0	0	0	1	0	0	0	0	0
NO CHANGE	22	1,136	21	1,110	0	0	0	0	1	26	0	0	0	0
OTHER	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	52	2,432	22	1,116	6	10	8	950	4	46	0	0	12	309
41-39 NEUTRALIZATION														
ENLARGE	2	24	2	24	0	0	0	0	0	0	0	0	0	0
UPGRADE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ENLARGE AND UPGRADE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
INSTALL IN NEW PLANT	16	207	0	0	1	10	12	186	0	0	0	0	3	10
REPLACE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ABANDON	4	8	3	7	0	0	0	0	1	0	0	0	0	0
NO CHANGE	10	131	9	123	0	0	0	0	1	7	0	0	0	0
OTHER	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	32	371	14	156	1	10	12	186	2	8	0	0	3	10
41-40 ALUM ADDITION TO PRIMARY														
ENLARGE	8	311	6	[illegible]	0	0	0	0	2	265	0	0	0	0
UPGRADE	1	10	0	0	0	0	0	0	1	10	0	0	0	0
ENLARGE AND UPGRADE	2	7	1	5	0	0	0	0	1	1	0	0	0	0
INSTALL IN NEW PLANT	49	1,482	0	0	8	701	29	585	0	0	0	0	12	194
REPLACE	1	5	0	0	1	5	0	0	0	0	0	0	0	0
ABANDON	21	153	20	153	0	0	0	0	1	0	0	0	0	0
NO CHANGE	41	2,507	37	2,477	0	0	0	0	4	29	0	0	0	0
OTHER	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	123	4,477	64	2,682	9	707	29	585	9	307	0	0	12	194
41-41 ALUM ADDITION TO SECONDARY														
ENLARGE	32	1,300	14	582	0	0	0	0	18	718	0	0	0	0
UPGRADE	9	83	4	37	0	0	0	0	5	45	0	0	0	0
ENLARGE AND UPGRADE	13	616	10	596	0	0	0	0	3	20	0	0	0	0
INSTALL IN NEW PLANT	435	5,056	0	0	38	481	181	3,155	0	0	3	29	213	1,391
REPLACE	1	1	0	0	0	0	0	0	1	1	0	0	0	0
ABANDON	20	131	18	122	0	0	1	0	1	8	0	0	0	0
NO CHANGE	188	4,168	177	3,367	0	0	0	0	11	801	0	0	0	0
OTHER	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	698	11,359	223	4,706	38	481	182	3,155	39	1,596	3	29	213	1,391
41-42 ALUM ADDITION TO SEPARATE STAGE TERTIARY														
ENLARGE	11	175	5	35	0	0	0	0	6	140	0	0	0	0
UPGRADE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ENLARGE AND UPGRADE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
INSTALL IN NEW PLANT	83	1,594	0	0	9	178	46	1,141	0	0	0	0	28	274
REPLACE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ABANDON	1	0	1	0	0	0	0	0	0	0	0	0	0	0
NO CHANGE	54	1,602	50	1,583	0	0	0	0	4	19	0	0	0	0
OTHER	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	149	3,372	56	1,618	9	178	46	1,141	10	159	0	0	28	274
41-43 FERRI-CHLORIDE ADDITION TO PRIMARY														
ENLARGE	3	32	2	32	0	0	0	0	1	0	0	0	0	0
UPGRADE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ENLARGE AND UPGRADE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
INSTALL IN NEW PLANT	12	291	0	0	0	0	9	212	0	0	0	0	3	78
REPLACE	1	3	1	3	0	0	0	0	0	0	0	0	0	0
ABANDON	12	243	12	243	0	0	0	0	0	0	0	0	0	0
NO CHANGE	26	976	25	971	0	0	0	0	1	5	0	0	0	0
OTHER	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	54	1,547	40	1,250	0	0	9	212	2	5	0	0	3	78
41-44 FERRI-CHLORIDE ADDITION TO SECONDARY														
ENLARGE	10	248	3	100	0	0	0	0	7	148	0	0	0	0
UPGRADE	6	70	6	70	0	0	0	0	0	0	0	0	0	0
ENLARGE AND UPGRADE	3	72	3	72	0	0	0	0	0	0	0	0	0	0
INSTALL IN NEW PLANT	110	783	0	0	15	118	67	557	0	0	0	0	28	107
REPLACE	1	5	0	0	0	0	0	0	1	5	0	0	0	0
ABANDON	8	92	7	92	0	0	1	0	0	0	0	0	0	0
NO CHANGE	138	4,007	131	3,978	0	0	0	0	7	28	0	0	0	0
OTHER	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	276	5,280	150	4,313	15	118	68	557	15	183	0	0	28	107

	Process Total		Type 1 Estimate Now in Use		Under Construction		Required but Not Funded		Type 2 Estimate Now in Use		Under Construction		Required but Not Funded	
	Plants	Flow	Plants	Flow	Plants	Flow	Plants	Flow	Plants	Flow	Plants	Flow	Plants	Flow
41-45 FERRI-CHLORIDE ADDITION TO SEPARATE STAGE TERTIARY														
ENLARGE	5	102	2	25	1	43	0	0	2	34	0	0	0	0
UPGRADE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ENLARGE AND UPGRADE	2	30	2	30	0	0	0	0	0	0	0	0	0	0
INSTALL IN NEW PLANT	25	1,714	0	0	2	1,207	11	381	0	0	0	0	12	124
REPLACE	1	5	1	5	0	0	0	0	0	0	0	0	0	0
ABANDON	1	0	0	0	0	0	0	0	1	0	0	0	0	0
NO CHANGE	23	256	21	254	0	0	0	0	2	2	0	0	0	0
OTHER	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	57	2,110	26	315	3	1,250	11	381	5	37	0	0	12	124
41-46 OTHER CHEMICAL ADDITIONS														
ENLARGE	11	208	6	60	0	0	0	0	5	147	0	0	0	0
UPGRADE	3	457	1	454	0	0	0	0	2	3	0	0	0	0
ENLARGE AND UPGRADE	4	48	2	30	0	0	0	0	2	18	0	0	0	0
INSTALL IN NEW PLANT	45	1,855	0	0	6	1,305	31	500	0	0	0	0	8	49
REPLACE	1	757	1	757	0	0	0	0	0	0	0	0	0	0
ABANDON	17	126	16	123	0	0	0	0	1	3	0	0	0	0
NO CHANGE	53	2,616	51	2,506	0	0	0	0	2	110	0	0	0	0
OTHER	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	134	6,069	77	3,932	6	1,305	31	500	12	282	0	0	8	49
41-47 ION EXCHANGE														
ENLARGE	1	0	0	0	0	0	0	0	1	0	0	0	0	0
UPGRADE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ENLARGE AND UPGRADE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
INSTALL IN NEW PLANT	5	47	0	0	0	0	4	46	0	0	0	0	1	0
REPLACE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ABANDON	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NO CHANGE	1	204	1	204	0	0	0	0	0	0	0	0	0	0
OTHER	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	7	252	1	204	0	0	4	46	1	0	0	0	1	0
41-48 BREAKPOINT CHLORINATION														
ENLARGE	1	85	0	0	0	0	0	0	1	85	0	0	0	0
UPGRADE	1	0	1	0	0	0	0	0	0	0	0	0	0	0
ENLARGE AND UPGRADE	1	90	0	0	1	90	0	0	0	0	0	0	0	0
INSTALL IN NEW PLANT	18	530	0	0	3	132	9	356	0	0	0	0	6	41
REPLACE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ABANDON	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NO CHANGE	8	117	7	114	0	0	0	0	1	3	0	0	0	0
OTHER	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	29	824	8	114	4	223	9	356	2	88	0	0	6	41
41-49 AMONIA STRIPPING														
ENLARGE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
UPGRADE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ENLARGE AND UPGRADE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
INSTALL IN NEW PLANT	6	53	0	0	0	0	3	42	0	0	0	0	3	10
REPLACE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ABANDON	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NO CHANGE	8	302	8	302	0	0	0	0	0	0	0	0	0	0
OTHER	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	14	356	8	302	0	0	3	42	0	0	0	0	3	10
41-50 DECHLORINATION														
ENLARGE	34	664	11	257	0	0	0	0	21	368	2	38	0	0
UPGRADE	1	0	1	0	0	0	0	0	0	0	0	0	0	0
ENLARGE AND UPGRADE	1	17	1	17	0	0	0	0	0	0	0	0	0	0
INSTALL IN NEW PLANT	291	1,928	0	0	30	289	106	1,195	0	0	1	73	154	370
REPLACE	1	5	1	5	0	0	0	0	0	0	0	0	0	0
ABANDON	11	278	11	278	0	0	0	0	0	0	0	0	0	0
NO CHANGE	136	1,699	119	1,631	0	0	0	0	17	68	0	0	0	0
OTHER	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	475	4,595	144	2,191	30	289	106	1,195	38	437	3	111	154	370
41-51 CHLORINATION FOR DISINFECTION														
ENLARGE	1,308	14,581	500	8,694	32	800	1	2	772	4,835	2	248	1	1
UPGRADE	359	5,751	200	5,150	2	19	0	0	157	581	0	0	0	0
ENLARGE AND UPGRADE	491	9,776	324	8,112	17	958	0	0	149	704	1	0	0	0
INSTALL IN NEW PLANT	7,868	21,582	0	0	272	2,087	1,756	14,361	3	6	5	77	5,832	5,055
REPLACE	285	3,695	167	3,279	8	97	1	16	107	292	1	9	1	0
ABANDON	961	4,499	937	4,489	3	0	2	0	18	9	0	0	1	0
NO CHANGE	4,403	45,413	3,808	38,201	3	5	1	0	591	7,207	0	0	0	0
OTHER	6	239	2	11	1	227	0	0	2	0	0	0	1	0
TOTAL	5,681	105,540	5,938	67,939	338	4,196	1,761	14,380	1,799	13,638	9	336	5,836	5,057

	Process Total		Type 1 Estimate Now in Use		Under Construction		Required but Not Funded		Type 2 Estimate Now in Use		Under Construction		Required but Not Funded	
	Plants	Flow	Plants	Flow	Plants	Flow	Plants	Flow	Plants	Flow	Plants	Flow	Plants	Flow
41-52 OZONATION FOR DISINFECTION														
ENLARGE	2	15	1	7	0	0	0	0	1	7	0	0	0	0
UPGRADE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ENLARGE AND UPGRADE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
INSTALL IN NEW PLANT	20	604	0	0	4	74	13	361	0	0	1	73	2	94
REPLACE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ABANDON	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NO CHANGE	21	1,547	19	1,073	0	0	1	454	1	18	0	0	0	0
OTHER	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	43	2,166	20	1,081	4	74	14	815	2	26	1	73	2	94
41-53 OTHER DISINFECTION														
ENLARGE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
UPGRADE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ENLARGE AND UPGRADE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
INSTALL IN NEW PLANT	9	13	0	0	2	3	6	9	0	0	0	0	1	0
REPLACE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ABANDON	1	2	1	2	0	0	0	0	0	0	0	0	0	0
NO CHANGE	5	3,455	5	3,455	0	0	0	0	0	0	0	0	0	0
OTHER	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	15	3,471	6	3,458	2	3	6	9	0	0	0	0	1	0
41-54 LAND TREATMENT OF PRIMARY EFFLUENT														
ENLARGE	3	1	1	1	0	0	0	0	2	0	0	0	0	0
UPGRADE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ENLARGE AND UPGRADE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
INSTALL IN NEW PLANT	25	42	0	0	1	2	21	39	0	0	0	0	3	0
REPLACE	1	0	1	0	0	0	0	0	0	0	0	0	0	0
ABANDON	63	71	12	38	0	0	0	0	51	33	0	0	0	0
NO CHANGE	10	9	9	9	0	0	0	0	1	0	0	0	0	0
OTHER	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	102	125	23	49	1	2	21	39	54	33	0	0	3	0
41-55 LAND TREATMENT OF SECONDARY EFFLUENT (30/30)														
ENLARGE	68	776	30	572	0	0	0	0	38	204	0	0	0	0
UPGRADE	7	77	5	65	0	0	0	0	2	12	0	0	0	0
ENLARGE AND UPGRADE	12	274	6	59	0	0	0	0	6	215	0	0	0	0
INSTALL IN NEW PLANT	474	2,888	0	0	11	84	250	1,880	0	0	0	0	213	923
REPLACE	2	3	1	3	0	0	0	0	1	0	0	0	0	0
ABANDON	25	151	22	148	0	0	0	0	3	3	0	0	0	0
NO CHANGE	382	1,690	311	1,384	0	0	0	0	71	306	0	0	0	0
OTHER	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	978	5,863	375	2,233	11	84	250	1,880	121	741	0	0	213	923
41-56 LAND TREATMENT OF INTERIMEDIATE EFFLUENT														
ENLARGE	17	55	3	31	0	0	0	0	14	24	0	0	0	0
UPGRADE	5	11	2	8	0	0	0	0	3	2	0	0	0	0
ENLARGE AND UPGRADE	2	15	0	0	0	0	0	0	2	15	0	0	0	0
INSTALL IN NEW PLANT	102	188	0	0	2	11	56	145	0	0	0	0	44	31
REPLACE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ABANDON	26	26	11	20	0	0	0	0	15	6	0	0	0	0
NO CHANGE	119	234	78	138	0	0	0	0	41	95	0	0	0	0
OTHER	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	271	532	94	199	2	11	56	145	75	144	0	0	44	31
41-57 STABILIZATION PONDS														
ENLARGE	878	2,623	207	1,482	12	18	0	0	659	1,122	0	0	0	0
UPGRADE	600	573	235	358	6	12	0	0	357	201	1	0	1	0
ENLARGE AND UPGRADE	364	580	199	437	11	23	0	0	153	119	1	0	0	0
INSTALL IN NEW PLANT	3,521	2,597	1	0	57	169	667	1,542	1	0	1	0	2,794	885
REPLACE	251	282	106	120	1	0	0	0	144	162	0	0	0	0
ABANDON	1,114	1,604	798	1,213	0	0	1	0	315	390	0	0	0	0
NO CHANGE	2,460	6,915	2,010	5,728	1	0	0	0	449	1,187	0	0	0	0
OTHER	32	82	24	71	0	0	0	0	7	9	0	0	1	1
TOTAL	9,220	15,262	3,580	9,414	88	224	668	1,542	2,085	3,193	3	1	2,796	886
41-58 AERATED LAGOONS														
ENLARGE	169	711	35	155	1	5	0	0	133	550	0	0	0	0
UPGRADE	106	632	50	474	0	0	1	1	55	156	0	0	0	0
ENLARGE AND UPGRADE	66	588	42	368	1	0	3	11	20	207	0	0	0	0
INSTALL IN NEW PLANT	2,614	2,221	0	0	68	248	527	1,292	0	0	0	0	2,019	682
REPLACE	30	73	11	41	0	0	0	0	19	31	0	0	0	0
ABANDON	133	390	108	288	0	0	0	0	25	102	0	0	0	0
NO CHANGE	664	2,536	599	2,400	0	0	0	0	65	135	0	0	0	0
OTHER	4	12	3	12	0	0	0	0	1	0	0	0	0	0
TOTAL	3,786	7,166	848	3,741	70	253	531	1,305	318	1,185	0	0	2,019	682

	Process Total		Type 1 Estimate Now in Use		Under Construction		Required but Not Funded		Type 2 Estimate Now in Use		Under Construction		Required but Not Funded	
	Plants	Flow	Plants	Flow	Plants	Flow	Plants	Flow	Plants	Flow	Plants	Flow	Plants	Flow
41-59 OUTFALL PUMPING														
ENLARGE	53	2,222	39	1,962	0	0	0	0	13	223	1	37	0	0
UPGRADE	6	731	5	722	0	0	0	0	1	9	0	0	0	0
ENLARGE AND UPGRADE	9	1,047	7	208	1	794	0	0	1	3	0	0	0	0
INSTALL IN NEW PLANT	283	5,752	0	0	13	1,283	205	4,325	0	0	0	0	65	143
REPLACE	7	1,777	3	322	1	1,162	0	0	3	293	0	0	0	0
ABANDON	32	390	32	390	0	0	0	0	0	0	0	0	0	0
NO CHANGE	156	7,698	143	5,373	0	0	0	0	13	2,328	0	0	0	0
OTHER	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	546	19,621	229	9,019	15	3,240	205	4,325	31	2,855	1	37	65	143
41-60 OUTFALL DIFFUSER														
ENLARGE	8	668	5	655	0	0	0	0	3	13	0	0	0	0
UPGRADE	2	7	1	0	0	0	0	0	1	7	0	0	0	0
ENLARGE AND UPGRADE	3	864	1	68	1	794	0	0	1	1	0	0	0	0
INSTALL IN NEW PLANT	50	5,043	0	0	8	247	25	4,747	0	0	0	0	17	48
REPLACE	3	281	2	16	0	0	0	0	1	264	0	0	0	0
ABANDON	2	329	2	329	0	0	0	0	0	0	0	0	0	0
NO CHANGE	53	3,718	50	3,700	0	0	0	0	3	17	0	0	0	0
OTHER	1	5	0	0	0	0	0	0	1	5	0	0	0	0
TOTAL	122	10,919	61	4,769	9	1,042	25	4,747	10	311	0	0	17	48
41-61 EFFLUENT TO OTHER PLANTS														
ENLARGE	3	51	0	0	0	0	0	0	3	51	0	0	0	0
UPGRADE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ENLARGE AND UPGRADE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
INSTALL IN NEW PLANT	18	461	0	0	2	10	15	428	0	0	0	0	1	22
REPLACE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ABANDON	5	91	5	91	0	0	0	0	0	0	0	0	0	0
NO CHANGE	4	88	4	88	0	0	0	0	0	0	0	0	0	0
OTHER	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	30	692	9	180	2	10	15	428	3	51	0	0	1	22
41-62 EFFLUENT OUTFALL														
ENLARGE	1,149	12,370	486	7,353	22	1,416	0	0	640	3,563	1	37	0	0
UPGRADE	391	3,848	184	3,414	3	3	0	0	204	429	0	0	0	0
ENLARGE AND UPGRADE	412	4,779	239	4,401	19	92	0	0	153	285	1	0	0	0
INSTALL IN NEW PLANT	7,103	13,466	3	0	218	1,339	1,241	7,841	3	2	2	6	5,636	4,284
REPLACE	486	3,375	268	2,485	17	213	0	0	201	676	0	0	0	0
ABANDON	1,552	5,746	1,504	5,619	2	0	2	15	43	112	0	0	1	0
NO CHANGE	8,664	81,031	6,214	70,821	1	0	0	0	2,448	10,246	0	0	1	0
OTHER	48	54	11	33	0	0	0	0	35	21	0	0	2	0
TOTAL	19,805	124,673	8,909	94,129	282	3,066	1,243	7,856	3,727	15,337	4	44	5,640	4,285
41-63 OTHER TREATMENT														
ENLARGE	21	728	7	679	1	24	0	0	13	24	0	0	0	0
UPGRADE	11	537	6	533	0	0	0	0	5	4	0	0	0	0
ENLARGE AND UPGRADE	7	681	5	678	0	0	0	0	2	3	0	0	0	0
INSTALL IN NEW PLANT	161	5,333	0	0	17	1,358	131	3,931	0	0	0	0	13	42
REPLACE	26	34	20	22	0	0	0	0	6	12	0	0	0	0
ABANDON	310	157	126	136	0	0	0	0	184	21	0	0	0	0
NO CHANGE	163	4,160	130	3,919	0	0	0	0	33	240	0	0	0	0
OTHER	2	1	2	1	0	0	0	0	0	0	0	0	0	0
TOTAL	701	11,636	296	5,971	18	1,383	131	3,931	243	306	0	0	13	42
41-64 RECALCINATION														
ENLARGE	5	475	2	289	0	0	0	0	3	185	0	0	0	0
UPGRADE	3	223	3	223	0	0	0	0	0	0	0	0	0	0
ENLARGE AND UPGRADE	1	378	1	378	0	0	0	0	0	0	0	0	0	0
INSTALL IN NEW PLANT	13	284	0	0	1	37	7	237	0	0	0	0	5	9
REPLACE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ABANDON	4	83	4	83	0	0	0	0	0	0	0	0	0	0
NO CHANGE	16	1,239	14	671	0	0	0	0	2	567	0	0	0	0
OTHER	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	42	2,683	24	1,646	1	37	7	237	5	753	0	0	5	9
41-65 AEROBIC DIGESTION - AIR														
ENLARGE	525	3,681	167	1,985	5	45	0	0	351	1,647	0	0	2	3
UPGRADE	119	877	59	751	0	0	0	0	60	126	0	0	0	0
ENLARGE AND UPGRADE	136	1,035	73	752	2	99	0	0	61	183	0	0	0	0
INSTALL IN NEW PLANT	2,800	10,840	0	0	137	2,008	740	5,755	0	0	2	73	1,921	2,606
REPLACE	52	158	30	90	0	0	0	0	22	68	0	0	0	0
ABANDON	354	1,193	339	1,181	0	0	0	0	15	11	0	0	0	0
NO CHANGE	1,783	11,015	1,568	9,860	1	0	1	0	212	1,153	0	0	1	0
OTHER	5	9	3	8	0	0	0	0	0	0	0	0	2	0
TOTAL	5,774	28,811	2,239	14,631	145	2,153	741	5,755	721	3,190	2	73	1,926	2,610

	Process Total		Type 1 Estimate Now in Use		Under Construction		Required but Not Funded		Type 2 Estimate Now in Use		Under Construction		Required but Not Funded	
	Plants	Flow	Plants	Flow	Plants	Flow	Plants	Flow	Plants	Flow	Plants	Flow	Plants	Flow
41-66 AEROBIC DIGESTION - OXYGEN														
ENLARGE	9	48	4	39	0	0	0	0	5	9	0	0	0	0
UPGRADE	2	57	1	56	0	0	0	0	1	0	0	0	0	0
ENLARGE AND UPGRADE	2	7	1	5	1	1	0	0	0	0	0	0	0	0
INSTALL IN NEW PLANT	27	805	0	0	2	30	21	764	0	0	0	0	4	9
REPLACE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ABANDON	8	55	8	55	0	0	0	0	0	0	0	0	0	0
NO CHANGE	26	442	25	427	0	0	0	0	1	15	0	0	0	0
OTHER	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	74	1,415	39	584	3	32	21	764	7	24	0	0	4	9
41-67 COMPOSTING														
ENLARGE	2	112	0	0	0	0	0	0	1	75	1	37	0	0
UPGRADE	3	2,638	2	1,181	0	0	0	0	1	1,457	0	0	0	0
ENLARGE AND UPGRADE	1	0	1	0	0	0	0	0	0	0	0	0	0	0
INSTALL IN NEW PLANT	25	1,478	0	0	2	107	20	735	0	0	1	9	2	625
REPLACE	1	18	1	18	0	0	0	0	0	0	0	0	0	0
ABANDON	1	1	1	1	0	0	0	0	0	0	0	0	0	0
NO CHANGE	9	173	8	168	0	0	0	0	1	4	0	0	0	0
OTHER	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	42	4,423	13	1,369	2	107	20	735	3	1,537	2	47	2	625
41-68 ANAEROBIC DIGESTION														
ENLARGE	637	16,394	310	11,591	19	455	0	0	307	4,310	1	37	0	0
UPGRADE	274	5,445	175	3,680	8	1,205	0	0	91	559	0	0	0	0
ENLARGE AND UPGRADE	351	7,733	249	6,374	12	731	0	0	90	627	0	0	0	0
INSTALL IN NEW PLANT	1,176	10,093	1	378	81	946	388	6,406	2	347	2	77	702	1,937
REPLACE	128	1,023	94	831	9	121	0	0	25	70	0	0	0	0
ABANDON	987	12,074	877	11,745	0	0	1	0	109	328	0	0	0	0
NO CHANGE	1,949	37,775	1,618	33,264	3	72	0	0	327	4,428	1	10	0	0
OTHER	14	917	10	155	2	758	0	0	1	2	0	0	1	1
TOTAL	5,516	91,457	3,334	68,020	134	4,291	389	6,406	952	10,676	4	125	703	1,938
41-69 SLUDGE LAGOONS														
ENLARGE	77	1,873	39	1,564	2	20	0	0	36	288	0	0	0	0
UPGRADE	31	805	19	162	0	0	1	0	11	642	0	0	0	0
ENLARGE AND UPGRADE	35	1,580	22	1,071	3	442	0	0	10	67	0	0	0	0
INSTALL IN NEW PLANT	150	2,413	0	0	10	98	114	2,237	0	0	0	0	26	77
REPLACE	9	71	6	24	1	31	0	0	2	15	0	0	0	0
ABANDON	108	2,167	96	2,123	0	0	0	0	12	43	0	0	0	0
NO CHANGE	349	8,080	296	7,762	0	0	0	0	53	318	0	0	0	0
OTHER	2	465	2	465	0	0	0	0	0	0	0	0	0	0
TOTAL	761	17,457	480	13,178	16	592	115	2,237	124	1,375	0	0	26	77
41-70 HEAT TREATMENT														
ENLARGE	30	1,510	13	1,202	1	43	0	0	16	264	0	0	0	0
UPGRADE	6	239	5	235	0	0	0	0	1	3	0	0	0	0
ENLARGE AND UPGRADE	6	681	3	229	1	435	0	0	2	16	0	0	0	0
INSTALL IN NEW PLANT	47	6,561	0	0	7	2,557	25	3,758	0	0	0	0	15	245
REPLACE	3	20	2	20	0	0	0	0	1	0	0	0	0	0
ABANDON	15	1,244	12	1,231	0	0	0	0	3	13	0	0	0	0
NO CHANGE	105	9,780	95	9,571	0	0	0	0	10	209	0	0	0	0
OTHER	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	212	20,039	130	12,491	9	3,035	25	3,758	33	507	0	0	15	245
41-71 CHLORINE OXIDATION OF SLUDGE (PURIFAX)														
ENLARGE	4	509	2	486	0	0	0	0	2	22	0	0	0	0
UPGRADE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ENLARGE AND UPGRADE	1	26	1	26	0	0	0	0	0	0	0	0	0	0
INSTALL IN NEW PLANT	18	180	0	0	3	45	11	133	0	0	0	0	4	1
REPLACE	1	10	1	10	0	0	0	0	0	0	0	0	0	0
ABANDON	3	381	3	381	0	0	0	0	0	0	0	0	0	0
NO CHANGE	27	587	25	512	0	0	0	0	2	75	0	0	0	0
OTHER	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	54	1,695	32	1,416	3	45	11	133	4	98	0	0	4	1
41-72 LIME STABILIZATION														
ENLARGE	8	614	3	488	1	43	0	0	3	45	1	37	0	0
UPGRADE	3	82	2	73	0	0	0	0	1	9	0	0	0	0
ENLARGE AND UPGRADE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
INSTALL IN NEW PLANT	37	640	0	0	4	46	28	548	0	0	1	5	4	40
REPLACE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ABANDON	6	234	6	234	0	0	0	0	0	0	0	0	0	0
NO CHANGE	50	2,160	44	1,700	0	0	0	0	6	460	0	0	0	0
OTHER	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	104	3,732	55	2,496	5	89	28	548	10	514	2	42	4	40

	Process Total		Type 1 Estimate Now in Use		Under Construction		Required but Not Funded		Type 2 Estimate Now in Use		Under Construction		Required but Not Funded	
	Plants	Flow	Plants	Flow	Plants	Flow	Plants	Flow	Plants	Flow	Plants	Flow	Plants	Flow
41-73 WET AIR OXIDATION														
ENLARGE	7	556	3	382	0	0	0	0	4	174	0	0	0	0
UPGRADE	1	90	1	90	0	0	0	0	0	0	0	0	0	0
ENLARGE AND UPGRADE	4	454	3	170	0	0	0	0	1	283	0	0	0	0
INSTALL IN NEW PLANT	5	361	0	0	3	94	2	266	0	0	0	0	0	0
REPLACE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ABANDON	5	228	5	228	0	0	0	0	0	0	0	0	0	0
NO CHANGE	34	1,842	31	1,687	0	0	0	0	3	155	0	0	0	0
OTHER	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	56	3,534	43	2,559	3	94	2	266	8	613	0	0	0	0
41-74 AIR DRYING														
ENLARGE	1,144	9,822	469	6,151	14	274	0	0	661	3,397	0	0	0	0
UPGRADE	215	2,998	114	1,220	4	39	0	0	97	1,738	0	0	0	0
ENLARGE AND UPGRADE	362	2,775	240	2,413	9	39	1	2	112	320	0	0	0	0
INSTALL IN NEW PLANT	3,798	9,633	2	2	139	408	833	5,453	3	372	2	11	2,820	3,391
REPLACE	303	1,161	122	855	3	19	0	0	178	286	0	0	0	0
ABANDON	1,110	4,798	1,061	4,747	1	1	0	0	47	49	0	0	1	0
NO CHANGE	3,584	28,126	2,955	25,301	5	28	0	0	622	2,795	0	0	2	1
OTHER	10	85	5	63	1	7	2	12	0	0	0	0	2	1
TOTAL	10,526	59,403	4,968	40,756	175	818	836	5,468	1,720	8,961	2	11	2,825	3,394
41-75 DEWATERING - MECHANICAL - VACUUM FILTER														
ENLARGE	228	8,538	104	5,946	14	504	2	123	108	1,964	0	0	0	0
UPGRADE	49	4,924	31	4,637	1	22	0	0	16	258	0	0	1	6
ENLARGE AND UPGRADE	65	4,774	44	3,621	2	765	0	0	19	389	0	0	0	0
INSTALL IN NEW PLANT	618	12,833	0	0	94	2,106	236	8,490	1	0	2	73	285	2,163
REPLACE	15	489	11	436	1	31	0	0	3	21	0	0	0	0
ABANDON	113	5,620	110	5,604	1	0	0	0	1	15	0	0	1	0
NO CHANGE	669	28,711	591	26,554	4	168	0	0	74	1,988	0	0	0	0
OTHER	2	19	2	19	0	0	0	0	0	0	0	0	0	0
TOTAL	1,759	65,911	893	46,820	117	3,596	238	8,613	222	4,638	2	73	287	2,169
41-76 DEWATERING - MECHANICAL - CENTRIFUGE														
ENLARGE	48	4,419	26	2,053	1	68	0	0	21	2,298	0	0	0	0
UPGRADE	9	345	8	337	0	0	0	0	1	7	0	0	0	0
ENLARGE AND UPGRADE	14	814	9	526	2	106	0	0	3	182	0	0	0	0
INSTALL IN NEW PLANT	79	10,111	0	0	17	584	52	8,822	0	0	1	13	9	691
REPLACE	3	52	2	47	0	0	0	0	1	5	0	0	0	0
ABANDON	10	434	10	434	0	0	0	0	0	0	0	0	0	0
NO CHANGE	128	7,037	116	6,477	0	0	0	0	12	559	0	0	0	0
OTHER	1	0	0	0	0	0	0	0	0	0	0	0	1	0
TOTAL	292	23,216	171	9,877	20	758	52	8,822	38	3,053	1	13	10	691
41-77 DEWATERING - MECHANICAL - FILTER PRESS														
ENLARGE	18	569	13	506	0	0	0	0	4	25	1	37	0	0
UPGRADE	1	5	1	5	0	0	0	0	0	0	0	0	0	0
ENLARGE AND UPGRADE	9	191	7	166	0	0	0	0	1	20	0	0	1	4
INSTALL IN NEW PLANT	124	7,660	0	0	7	2,361	103	4,914	0	0	1	264	13	118
REPLACE	1	6	1	6	0	0	0	0	0	0	0	0	0	0
ABANDON	2	34	2	34	0	0	0	0	0	0	0	0	0	0
NO CHANGE	74	2,906	67	2,461	0	0	1	15	6	430	0	0	0	0
OTHER	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	229	11,374	91	3,180	7	2,361	104	4,930	11	476	2	302	14	123
41-78 DEWATERING - OTHERS														
ENLARGE	2	76	1	75	0	0	0	0	1	0	0	0	0	0
UPGRADE	1	5	1	5	0	0	0	0	0	0	0	0	0	0
ENLARGE AND UPGRADE	2	1,241	1	1,237	0	0	0	0	1	3	0	0	0	0
INSTALL IN NEW PLANT	19	202	0	0	1	2	10	72	0	0	0	0	8	127
REPLACE	1	1	1	1	0	0	0	0	0	0	0	0	0	0
ABANDON	5	8	5	8	0	0	0	0	0	0	0	0	0	0
NO CHANGE	18	414	17	410	0	0	0	0	1	3	0	0	0	0
OTHER	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	48	1,950	26	1,740	1	2	10	72	3	8	0	0	8	127
41-79 GRAVITY THICKENING														
ENLARGE	136	7,931	66	6,087	4	101	1	117	65	1,624	0	0	0	0
UPGRADE	23	1,658	20	1,625	0	0	0	0	3	32	0	0	0	0
ENLARGE AND UPGRADE	31	3,066	21	2,194	2	762	0	0	8	110	0	0	0	0
INSTALL IN NEW PLANT	438	10,565	1	22	60	2,524	210	6,564	0	0	0	0	167	1,454
REPLACE	7	180	6	175	0	0	0	0	1	5	0	0	0	0
ABANDON	69	4,791	67	4,769	0	0	0	0	2	22	0	0	0	0
NO CHANGE	449	22,159	406	20,296	1	41	0	0	42	1,821	0	0	0	0
OTHER	1	75	1	75	0	0	0	0	0	0	0	0	0	0
TOTAL	1,154	50,429	588	35,245	67	3,431	211	6,681	121	3,617	0	0	167	1,454

	Process Total		Type 1 Estimate Now in Use		Under Construction		Required but Not Funded		Type 2 Estimate Now in Use		Under Construction		Required but Not Funded	
	Plants	Flow	Plants	Flow	Plants	Flow	Plants	Flow	Plants	Flow	Plants	Flow	Plants	Flow
41-80 AIR FLOTATION THICKENING														
ENLARGE	45	3,958	27	3,005	1	227	0	0	16	688	1	37	0	0
UPGRADE	6	272	5	247	0	0	0	0	1	24	0	0	0	0
ENLARGE AND UPGRADE	4	800	4	800	0	0	0	0	0	0	0	0	0	0
INSTALL IN NEW PLANT	139	10,684	0	0	16	1,097	104	7,983	0	0	1	264	18	1,337
REPLACE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ABANDON	8	1,328	8	1,328	0	0	0	0	0	0	0	0	0	0
NO CHANGE	138	8,925	125	8,154	0	0	0	0	13	770	0	0	0	0
OTHER	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	340	25,969	169	13,536	17	1,324	104	7,983	30	1,483	2	302	18	1,337
41-81 INCINERATION - MULTIPLE HEARTH														
ENLARGE	62	4,327	32	2,811	4	271	1	227	25	1,016	0	0	0	0
UPGRADE	22	5,269	17	4,398	1	757	0	0	4	113	0	0	0	0
ENLARGE AND UPGRADE	16	3,066	13	2,742	0	0	0	0	3	324	0	0	0	0
INSTALL IN NEW PLANT	89	7,707	0	0	16	901	53	6,106	0	0	2	338	18	360
REPLACE	8	1,010	6	991	0	0	0	0	2	18	0	0	0	0
ABANDON	40	1,184	37	1,149	0	0	0	0	3	35	0	0	0	0
NO CHANGE	166	13,059	143	11,094	1	1	1	60	21	1,902	0	0	0	0
OTHER	1	1,169	0	0	0	0	1	1,169	0	0	0	0	0	0
TOTAL	404	36,794	248	23,188	22	1,931	56	7,563	58	3,410	2	338	18	360
41-82 INCINERATION - FLUIDIZED BEDS														
ENLARGE	2	19	2	19	0	0	0	0	0	0	0	0	0	0
UPGRADE	1	124	1	124	0	0	0	0	0	0	0	0	0	0
ENLARGE AND UPGRADE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
INSTALL IN NEW PLANT	3	287	0	0	1	22	1	264	0	0	0	0	1	0
REPLACE	1	14	1	14	0	0	0	0	0	0	0	0	0	0
ABANDON	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NO CHANGE	15	1,091	13	1,059	0	0	0	0	2	31	0	0	0	0
OTHER	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	22	1,537	17	1,218	1	22	1	264	2	31	0	0	1	0
41-83 INCINERATION - ROTARY KILN														
ENLARGE	1	0	0	0	0	0	0	0	1	0	0	0	0	0
UPGRADE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ENLARGE AND UPGRADE	2	140	2	140	0	0	0	0	0	0	0	0	0	0
INSTALL IN NEW PLANT	0	0	0	0	0	0	0	0	0	0	0	0	0	0
REPLACE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ABANDON	2	12	2	12	0	0	0	0	0	0	0	0	0	0
NO CHANGE	3	83	3	83	0	0	0	0	0	0	0	0	0	0
OTHER	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	8	236	7	236	0	0	0	0	1	0	0	0	0	0
41-84 INCINERATION - OTHERS														
ENLARGE	2	125	2	125	0	0	0	0	0	0	0	0	0	0
UPGRADE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ENLARGE AND UPGRADE	1	511	1	511	0	0	0	0	0	0	0	0	0	0
INSTALL IN NEW PLANT	2	223	0	0	0	0	2	223	0	0	0	0	0	0
REPLACE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ABANDON	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NO CHANGE	10	439	9	415	0	0	0	0	1	24	0	0	0	0
OTHER	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	15	1,298	12	1,051	0	0	2	223	1	24	0	0	0	0
41-85 PYROLYSIS														
ENLARGE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
UPGRADE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ENLARGE AND UPGRADE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
INSTALL IN NEW PLANT	4	121	0	0	0	0	4	121	0	0	0	0	0	0
REPLACE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ABANDON	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NO CHANGE	2	97	2	97	0	0	0	0	0	0	0	0	0	0
OTHER	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	6	219	2	97	0	0	4	121	0	0	0	0	0	0
41-86 CO-INCINERATION WITH SOLID WASTE														
ENLARGE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
UPGRADE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ENLARGE AND UPGRADE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
INSTALL IN NEW PLANT	3	6	0	0	0	0	3	6	0	0	0	0	0	0
REPLACE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ABANDON	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NO CHANGE	5	140	5	140	0	0	0	0	0	0	0	0	0	0
OTHER	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	8	146	5	140	0	0	3	6	0	0	0	0	0	0

	Process Total		Type 1 Estimate Now in Use		Under Construction		Required but Not Funded		Type 2 Estimate Now in Use		Under Construction		Required but Not Funded	
	Plants	Flow	Plants	Flow	Plants	Flow	Plants	Flow	Plants	Flow	Plants	Flow	Plants	Flow
41-87 CO-PYROLYSIS WITH SOLID WASTE														
ENLARGE	1	1	0	0	0	0	0	0	1	1	0	0	0	0
UPGRADE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ENLARGE AND UPGRADE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
INSTALL IN NEW PLANT	3	276	0	0	0	0	2	275	0	0	0	0	1	0
REPLACE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ABANDON	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NO CHANGE	5	12	5	12	0	0	0	0	0	0	0	0	0	0
OTHER	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	9	290	5	12	0	0	2	275	1	1	0	0	1	0
41-88 CO-INCINERATION - OTHERS														
ENLARGE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
UPGRADE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ENLARGE AND UPGRADE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
INSTALL IN NEW PLANT	0	0	0	0	0	0	0	0	0	0	0	0	0	0
REPLACE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ABANDON	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NO CHANGE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
OTHER	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	0	0	0	0	0	0	0	0	0	0	0	0	0	0
41-89 LAND FILL														
ENLARGE	605	9,414	248	4,612	6	452	0	0	351	4,349	0	0	0	0
UPGRADE	70	1,264	35	1,167	2	9	2	4	31	83	0	0	0	0
ENLARGE AND UPGRADE	94	5,903	61	5,053	2	763	0	0	31	86	0	0	0	0
INSTALL IN NEW PLANT	3,624	13,091	3	127	171	1,047	818	8,502	1	3	2	73	2,629	3,341
REPLACE	106	475	46	350	1	3	0	0	59	121	0	0	0	0
ABANDON	852	5,161	828	5,136	0	0	0	0	20	22	0	0	4	2
NO CHANGE	4,208	45,889	3,133	40,260	4	84	0	0	1,070	5,543	0	0	1	1
OTHER	2	761	0	0	0	0	1	757	1	4	0	0	0	0
TOTAL	9,561	81,961	4,354	56,709	186	2,362	821	9,264	1,564	10,214	2	73	2,634	3,345
41-90 LAND SPREADING OF LIQUID SLUDGE														
ENLARGE	74	515	28	247	1	7	0	0	45	260	0	0	0	0
UPGRADE	20	226	13	168	1	22	0	0	6	35	0	0	0	0
ENLARGE AND UPGRADE	38	3,597	30	3,575	2	16	0	0	6	5	0	0	0	0
INSTALL IN NEW PLANT	529	1,908	1	1	34	365	179	1,244	0	0	0	0	315	296
REPLACE	13	93	[illegible]	87	0	0	0	0	4	5	0	0	0	0
ABANDON	147	986	139	902	0	0	0	0	8	84	0	0	0	0
NO CHANGE	889	6,155	684	4,983	2	14	0	0	203	1,157	0	0	0	0
OTHER	2	19	2	19	0	0	0	0	0	0	0	0	0	0
TOTAL	1,712	13,502	906	9,986	40	426	179	1,244	272	1,549	0	0	315	296
41-91 LAND SPREADING OF THICKENED SLUDGE														
ENLARGE	85	2,194	54	1,897	1	24	0	0	30	272	0	0	0	0
UPGRADE	15	139	7	116	1	10	0	0	7	12	0	0	0	0
ENLARGE AND UPGRADE	40	3,685	26	3,625	1	5	0	0	13	54	0	0	0	0
INSTALL IN NEW PLANT	260	4,625	1	0	16	231	149	4,108	0	0	0	0	94	285
REPLACE	7	80	6	80	0	0	0	0	1	0	0	0	0	0
ABANDON	101	1,600	99	1,599	0	0	0	0	2	0	0	0	0	0
NO CHANGE	679	7,856	551	6,787	1	18	0	0	127	1,050	0	0	0	0
OTHER	2	471	1	17	0	0	1	454	0	0	0	0	0	0
TOTAL	1,189	20,654	745	14,124	20	291	150	4,562	180	1,390	0	0	94	285
41-92 TRENCHING														
ENLARGE	1	1	1	1	0	0	0	0	0	0	0	0	0	0
UPGRADE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ENLARGE AND UPGRADE	1	50	0	0	0	0	0	0	1	50	0	0	0	0
INSTALL IN NEW PLANT	2	7	0	0	1	7	0	0	0	0	0	0	1	0
REPLACE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ABANDON	1	1,169	1	1,169	0	0	0	0	0	0	0	0	0	0
NO CHANGE	5	26	5	26	0	0	0	0	0	0	0	0	0	0
OTHER	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	10	1,255	7	1,197	1	7	0	0	1	50	0	0	1	0
41-93 OCEAN DUMPING														
ENLARGE	1	2	0	0	0	0	0	0	1	2	0	0	0	0
UPGRADE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ENLARGE AND UPGRADE	1	20	1	20	0	0	0	0	0	0	0	0	0	0
INSTALL IN NEW PLANT	0	0	0	0	0	0	0	0	0	0	0	0	0	0
REPLACE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ABANDON	42	11,615	37	11,397	0	0	0	0	5	217	0	0	0	0
NO CHANGE	5	61	5	61	0	0	0	0	0	0	0	0	0	0
OTHER	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	49	11,699	43	11,480	0	0	0	0	6	219	0	0	0	0

	Process Total		Type 1 Estimate Now in Use		Under Construction		Required but Not Funded		Type 2 Estimate Now in Use		Under Construction		Required but Not Funded	
	Plants	Flow	Plants	Flow	Plants	Flow	Plants	Flow	Plants	Flow	Plants	Flow	Plants	Flow
41-94 OTHER SLUDGE HANDLING														
ENLARGE	22	503	6	170	2	67	0	0	14	264	0	0	0	0
UPGRADE	10	774	4	670	0	0	0	0	6	104	0	0	0	0
ENLARGE AND UPGRADE	5	3,191	5	3,191	0	0	0	0	0	0	0	0	0	0
INSTALL IN NEW PLANT	149	11,194	0	0	14	243	112	10,299	0	0	1	264	22	385
REPLACE	3	12	3	12	0	0	0	0	0	0	0	0	0	0
ABANDON	60	1,792	54	1,779	0	0	0	0	6	13	0	0	0	0
NO CHANGE	160	4,892	137	4,476	0	0	0	0	23	415	0	0	0	0
OTHER	2	1,476	1	18	0	0	0	0	1	1,457	0	0	0	0
TOTAL	411	23,836	210	10,319	16	311	112	10,299	50	2.255	1	264	22	385
41-95 DIGEST GAS UTILIZATION FACILITIES														
ENLARGE	22	2,582	12	1,297	2	1,205	0	0	8	79	0	0	0	0
UPGRADE	5	75	3	58	0	0	0	0	2	17	0	0	0	0
ENLARGE AND UPGRADE	24	2,015	20	533	1	15	0	0	3	1,466	0	0	0	0
INSTALL IN NEW PLANT	42	4,442	0	0	2	70	32	4,069	0	0	0	0	8	303
REPLACE	4	40	4	40	0	0	0	0	0	0	0	0	0	0
ABANDON	22	1,414	22	1,414	0	0	0	0	0	0	0	0	0	0
NO CHANGE	113	5,761	90	5,439	1	6	0	0	22	315	0	0	0	0
OTHER	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	232	16,333	151	8,785	6	1,296	32	4,069	35	1,878	0	0	8	303
41-96 CONTROL/LAB,MAINTENANCE BUILDINGS														
ENLARGE	589	10,858	242	6,851	4	1,458	1	2	341	2,509	1	37	0	0
UPGRADE	450	9,005	249	7,670	5	41	0	0	196	1,293	0	0	0	0
ENLARGE AND UPGRADE	657	15,819	424	11,391	13	1,860	0	0	218	2,567	1	0	1	0
INSTALL IN NEW PLANT	6,410	16,123	1	227	215	1,585	1,336	9,507	2	3	5	349	4,851	4,457
REPLACE	216	1,721	125	1,429	9	88	0	0	81	194	0	0	1	9
ABANDON	725	3,904	721	3,892	0	0	1	0	2	11	0	0	1	0
NO CHANGE	5,610	62,496	4,379	54,923	4	13	2	7	1,222	7,551	0	0	3	0
OTHER	2	12	1	12	0	0	0	0	0	0	0	0	1	0
TOTAL	14,659	119,942	6,142	86,397	250	5,050	1,340	9,518	2,062	14,131	7	387	4,858	4,467
41-97 FULLY AUTOMATED USING DIGITAL CONTROL														
ENLARGE	6	1,107	4	728	0	0	0	0	2	378	0	0	0	0
UPGRADE	2	1,589	0	0	0	0	0	0	2	1,589	0	0	0	0
ENLARGE AND UPGRADE	1	511	1	511	0	0	0	0	0	0	0	0	0	0
INSTALL IN NEW PLANT	29	4,641	0	0	3	1,930	15	2,344	0	0	0	0	11	366
REPLACE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ABANDON	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NO CHANGE	30	2,714	27	2,138	0	0	0	0	3	575	0	0	0	0
OTHER	1	541	0	0	0	0	0	0	1	541	0	0	0	0
TOTAL	69	11,105	32	3,378	3	1,930	15	2,344	8	3,085	0	0	11	366
41-98 FULLY AUTOMATED USING ANALOG CONTROLS														
ENLARGE	5	277	0	0	0	0	0	0	5	277	0	0	0	0
UPGRADE	7	620	3	463	0	0	0	0	4	157	0	0	0	0
ENLARGE AND UPGRADE	4	82	4	82	0	0	0	0	0	0	0	0	0	0
INSTALL IN NEW PLANT	20	2,398	1	851	4	117	10	1,337	0	0	1	68	4	24
REPLACE	9	279	8	279	0	0	0	0	1	0	0	0	0	0
ABANDON	3	48	3	48	0	0	0	0	0	0	0	0	0	0
NO CHANGE	49	4,038	46	2,848	1	1,169	0	0	2	20	0	0	0	0
OTHER	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	97	7,745	65	4,573	5	1,287	10	1,337	12	455	1	68	4	24
41-99 SEMI AUTOMATED PLANT														
ENLARGE	743	7,393	228	4,446	2	270	1	56	512	2,619	0	0	0	0
UPGRADE	1,107	18,754	536	16,478	6	72	0	0	563	2,202	1	0	1	1
ENLARGE AND UPGRADE	945	14,728	546	11,320	26	1,268	0	0	373	2,140	0	0	0	0
INSTALL IN NEW PLANT	5,661	14,251	1	2	223	1,262	1,289	9,116	1	0	2	187	4,145	3,689
REPLACE	606	2,085	297	1,494	9	138	0	0	300	453	0	0	0	0
ABANDON	1,214	7,470	1,203	7,466	1	0	0	0	10	4	0	0	0	0
NO CHANGE	5,888	58,909	4,873	52,463	2	6	1	0	1,011	6,440	0	0	1	0
OTHER	23	837	14	746	1	1	0	0	8	88	0	0	0	0
TOTAL	16,187	124,431	7,698	94,418	270	3,020	1,291	9,173	2,778	13,950	3	187	4,147	3,690
41-A1 MANUALLY OPERTED AND CONTROLLED PLANT														
ENLARGE	271	792	65	265	4	2	0	0	201	486	1	37	0	0
UPGRADE	310	687	102	300	1	2	0	0	207	384	0	0	0	0
ENLARGE AND UPGRADE	256	580	150	404	6	38	0	0	98	137	1	0	1	0
INSTALL IN NEW PLANT	2,971	1,626	0	0	46	149	427	614	2	20	1	0	2,495	841
REPLACE	150	228	59	165	3	2	0	0	88	65	0	0	0	0
ABANDON	729	1,643	561	1,370	0	0	0	0	168	272	0	0	0	0
NO CHANGE	2,686	4,905	1,938	4,071	2	7	0	0	746	826	0	0	0	0
OTHER	13	126	11	114	0	0	0	0	2	11	0	0	0	0
TOTAL	7,386	10,591	2,886	6,693	62	203	427	614	1,512	2,201	3	38	2,496	841

60<

	Process Total		Type 1 Estimate Now in Use		Under Construction		Required but Not Funded		Type 2 Estimate Now in Use		Under Construction		Required but Not Funded	
	Plants	Flow	Plants	Flow	Plants	Flow	Plants	Flow	Plants	Flow	Plants	Flow	Plants	Flow
41-A2 PACKAGE PLANT														
ENLARGE	133	96	30	30	0	0	0	0	103	66	0	0	0	0
UPGRADE	90	65	34	37	0	0	0	0	56	28	0	0	0	0
ENLARGE AND UPGRADE	105	148	49	105	0	0	0	0	56	42	0	0	0	0
INSTALL IN NEW PLANT	1,396	871	1	0	73	83	283	254	0	0	0	0	1,039	532
REPLACE	19	16	14	8	1	6	0	0	4	1	0	0	0	0
ABANDON	436	553	413	538	1	0	0	0	22	15	0	0	0	0
NO CHANGE	942	1,007	802	933	1	0	0	0	139	74	0	0	0	0
OTHER	1	0	1	0	0	0	0	0	0	0	0	0	0	0
TOTAL	3,122	2,759	1,344	1,654	76	90	283	254	380	228	0	0	1,039	532
41-A3 SEMI-PACKAGE PLANT														
ENLARGE	209	660	49	206	1	4	0	0	158	411	1	37	0	0
UPGRADE	141	602	52	316	0	0	0	0	89	286	0	0	0	0
ENLARGE AND UPGRADE	146	547	67	324	4	49	0	0	75	173	0	0	0	0
INSTALL IN NEW PLANT	1,895	1,875	1	0	50	77	254	832	0	0	1	0	1,589	963
REPLACE	147	389	47	204	1	3	0	0	99	181	0	0	0	0
ABANDON	253	900	244	880	0	0	0	0	9	19	0	0	0	0
NO CHANGE	1,046	3,551	876	3,241	1	0	0	0	169	309	0	0	0	0
OTHER	10	51	5	29	0	0	0	0	5	22	0	0	0	0
TOTAL	3,847	8,578	1,341	5,203	57	135	254	832	604	1,404	2	37	1,589	963
41-A4 CUSTOM BUILT PLANT														
ENLARGE	816	9,431	279	5,990	7	299	1	56	528	3,085	0	0	1	0
UPGRADE	1,259	18,214	541	14,126	10	111	0	0	707	3,977	1	0	0	0
ENLARGE AND UPGRADE	1,323	26,447	811	21,739	33	2,108	1	83	477	2,516	1	0	0	0
INSTALL IN NEW PLANT	5,242	14,201	2	3	150	1,415	1,149	9,209	2	0	3	188	3,936	3,390
REPLACE	555	2,049	296	1,683	10	61	0	0	249	304	0	0	0	0
ABANDON	1,172	4,888	1,071	4,742	0	0	2	0	99	146	0	0	0	0
NO CHANGE	6,206	59,681	4,963	53,254	4	33	0	0	1,237	6,395	0	0	2	0
OTHER	29	1,461	23	841	0	0	0	0	6	620	0	0	0	0
TOTAL	16,602	136,375	7,986	102,382	214	4,029	1,153	9,349	3,305	17,045	5	189	3,939	3,390
41-A5 IMHOFF TANKS														
ENLARGE	1	0	0	0	0	0	0	0	1	0	0	0	0	0
UPGRADE	7	6	7	6	0	0	0	0	0	0	0	0	0	0
ENLARGE AND UPGRADE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
INSTALL IN NEW PLANT	4	3	0	0	0	0	4	3	0	0	0	0	0	0
REPLACE	5	3	2	0	0	0	0	0	3	3	0	0	0	0
ABANDON	228	253	63	46	0	0	0	0	165	207	0	0	0	0
NO CHANGE	77	64	59	48	0	0	0	0	18	15	0	0	0	0
OTHER	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	322	331	131	101	0	0	4	3	187	226	0	0	0	0
41-A6 SEPTIC TANKS														
ENLARGE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
UPGRADE	9	4	3	3	0	0	0	0	6	1	0	0	0	0
ENLARGE AND UPGRADE	2	0	2	0	0	0	0	0	0	0	0	0	0	0
INSTALL IN NEW PLANT	39	14	0	0	5	1	32	12	0	0	0	0	2	0
REPLACE	1	0	1	0	0	0	0	0	0	0	0	0	0	0
ABANDON	18	4	3	0	0	0	0	0	15	4	0	0	0	0
NO CHANGE	18	3	13	3	0	0	0	0	5	0	0	0	0	0
OTHER	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	87	27	22	7	5	1	32	12	26	5	0	0	2	0
41-A7 ELECTRODIALYSIS														
ENLARGE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
UPGRADE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ENLARGE AND UPGRADE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
INSTALL IN NEW PLANT	0	0	0	0	0	0	0	0	0	0	0	0	0	0
REPLACE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ABANDON	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NO CHANGE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
OTHER	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	0	0	0	0	0	0	0	0	0	0	0	0	0	0
41-A8 REVERSE OSMOSIS														
ENLARGE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
UPGRADE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ENLARGE AND UPGRADE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
INSTALL IN NEW PLANT	1	37	0	0	0	0	1	37	0	0	0	0	0	0
REPLACE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ABANDON	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NO CHANGE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
OTHER	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	1	37	0	0	0	0	1	37	0	0	0	0	0	0

	Process Total		Type 1 Estimate Now in Use		Under Construction		Required but Not Funded		Type 2 Estimate Now in Use		Under Construction		Required but Not Funded	
	Plants	Flow	Plants	Flow	Plants	Flow	Plants	Flow	Plants	Flow	Plants	Flow	Plants	Flow
41-A9 PRESSURE FILTERS														
ENLARGE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
UPGRADE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ENLARGE AND UPGRADE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
INSTALL IN NEW PLANT	0	0	0	0	0	0	0	0	0	0	0	0	0	0
REPLACE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ABANDON	2	22	2	22	0	0	0	0	0	0	0	0	0	0
NO CHANGE	1	5	1	5	0	0	0	0	0	0	0	0	0	0
OTHER	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	3	28	3	28	0	0	0	0	0	0	0	0	0	0
41-AA SEEPAGE LAGOONS														
ENLARGE	39	11	5	1	0	0	0	0	34	10	0	0	0	0
UPGRADE	3	0	1	0	0	0	0	0	2	0	0	0	0	0
ENLARGE AND UPGRADE	2	0	1	0	0	0	0	0	1	0	0	0	0	0
INSTALL IN NEW PLANT	241	87	0	0	36	15	90	54	0	0	0	0	115	18
REPLACE	2	0	1	0	0	0	0	0	1	0	0	0	0	0
ABANDON	9	4	6	4	0	0	0	0	3	0	0	0	0	0
NO CHANGE	266	60	254	57	0	0	0	0	12	3	0	0	0	0
OTHER	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	562	166	268	64	36	15	90	54	53	14	0	0	115	18
41-AB ROCK FILTERS														
ENLARGE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
UPGRADE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ENLARGE AND UPGRADE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
INSTALL IN NEW PLANT	5	4	0	0	0	0	3	4	0	0	0	0	2	0
REPLACE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ABANDON	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NO CHANGE	1	0	1	0	0	0	0	0	0	0	0	0	0	0
OTHER	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	6	5	1	0	0	0	3	4	0	0	0	0	2	0
41-AC POLYMER ADDITION TO LIQUID STREAM														
ENLARGE	2	23	0	0	0	0	0	0	2	23	0	0	0	0
UPGRADE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ENLARGE AND UPGRADE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
INSTALL IN NEW PLANT	90	383	0	0	9	83	17	206	0	0	0	0	64	93
REPLACE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ABANDON	3	357	3	357	0	0	0	0	0	0	0	0	0	0
NO CHANGE	4	572	2	5	0	0	0	0	2	567	0	0	0	0
OTHER	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	99	1,338	5	363	9	83	17	206	4	591	0	0	64	93
41-AD POLYMER ADDITION TO SLUDGE STREAM														
ENLARGE	2	115	1	104	0	0	0	0	1	11	0	0	0	0
UPGRADE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ENLARGE AND UPGRADE	1	511	1	511	0	0	0	0	0	0	0	0	0	0
INSTALL IN NEW PLANT	98	757	0	0	7	89	13	201	0	0	0	0	78	467
REPLACE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ABANDON	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NO CHANGE	5	321	4	319	0	0	0	0	1	1	0	0	0	0
OTHER	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	106	1,705	6	934	7	89	13	201	2	13	0	0	78	467

Chapter III

62<

Summaries of Conveyance Systems Technical Data (Categories IIIA, IIIB, IVA, IVB)

Technical data on the municipal sewage conveyance facilities which will be required by the year 2000 were compiled in the course of the 1980 Needs Survey. The data were collected using the EPA-1 form which is described in detail in Appendix C.

The technical data for each conveyance facility were collected at the same time the dollar need data were collected. The data were obtained from several sources, including the 1978 Needs Survey data, EPA Construction Grant files, and various engineering plans and reports. A further description of the sources and methods used in collecting data for the 1980 Needs Survey is presented in Appendix A.

The technical data collected for all conveyance facilities have been compiled and are presented in the 12 tables which follow. The technical tables which follow are structured such that a discussion of each table is presented immediately before the table.

Table 42

Collection Populations— Present and Projected, Resident and Nonresident

(In Thousands)

Table 42 summarizes the populations, by State, for 1980 and 2000 which are now or will be receiving collection of their wastewaters.

The values listed for the year 2000 State ceiling populations were obtained from data provided by the Department of Commerce, Bureau of Economic Analysis (BEA). The projections were produced by BEA after extensive analysis which included review and comment by State agencies responsible for population projections.

Resident Populations (RES) are permanent residents within the service area of an established sewerage authority. Nonresident Populations (NONRES) include commuters living in one service area and working in another, as well as temporary residents at resort areas and similar locations.

A person is included in the Receiving Collection category if their residence is connected to a central collection system operated by an established sewerage authority. A person is included in the Not Receiving Collection category if they reside in the service area of an established sewerage authority but their residence is not connected to a central collection system. Theoretically, the sum of the populations receiving collection and not receiving collection should equal the State's total population. This is not always the case because many rural residents, who are counted as a part of the State's total, do not reside in the service area of any established sewerage authority and, therefore, are not included in any receiving collection categories.

The Percent Served values are based upon a comparison between the resident population receiving collection and the State population ceiling figures provided by BEA.

		RECEIVING COLLECTION				NOT RECEIVING COLLECTION				PERCENT SERVED	
STATE	2000 CEILING POPULATION	1980 RES.	2000 RES.	1980 NONRES.	2000 NONRES.	1980 RES.	2000 RES.	1980 NONRES.	2000 NONRES.	1980	2000
ALABAMA	4,140	2,012	3,416	103	204	523	81	2	0	53.4	82.5
ALASKA	667	218	679	3	19	105	15	3	0	53.9	101.8
ARIZONA	4,149	1,759	3,824	78	200	310	122	14	6	71.8	92.2
ARKANSAS	2,970	1,242	2,525	24	47	216	6	0	0	57.0	85.0
CALIFORNIA	26,786	19,458	26,121	1,083	1,486	1,524	225	44	6	85.7	97.5
COLORADO	4,371	2,189	3,886	131	527	39	2	0	0	79.0	88.9
CONNECTICUT	3,741	1,886	2,876	30	59	1,202	864	0	0	60.6	76.9
DELAWARE	841	479	823	101	439	82	21	31	0	82.4	97.9
DIST. OF COLUM.	661	729	811	744	913	0	0	0	0	111.2	122.7
FLORIDA	15,049	5,229	13,396	944	1,808	2,128	405	7	3	59.0	89.0
GEORGIA	7,053	3,118	6,019	138	233	767	315	3	0	60.9	85.3
HAWAII	1,366	586	1,359	90	255	211	13	8	3	64.1	99.6
IDAHO	1,183	485	1,058	13	79	114	15	23	4	53.6	89.5
ILLINOIS	12,358	9,702	11,976	32	42	290	138	0	0	86.4	96.9
INDIANA	6,059	3,514	4,961	242	501	390	24	54	0	65.1	81.9
IOWA	3,101	2,090	2,837	75	128	150	9	20	0	72.0	91.5
KANSAS	2,517	1,841	2,644	13	18	176	4	1	0	77.7	105.1
KENTUCKY	4,224	1,748	3,345	60	97	692	256	0	0	49.6	79.2
LOUISIANA	4,659	2,846	4,571	68	103	408	1	10	0	70.7	98.1
MAINE	1,222	572	952	87	132	342	224	3	1	52.2	77.9
MARYLAND	5,583	3,156	5,517	133	493	538	130	139	0	76.1	98.8
MASSACHUSETTS	6,614	3,974	5,784	65	200	1,527	863	68	60	68.9	87.5
MICHIGAN	10,314	7,035	9,077	99	246	1,374	622	36	20	76.4	88.0
MINNESOTA	4,505	2,940	3,733	23	40	210	62	6	0	72.4	82.9
MISSISSIPPI	2,740	1,381	2,576	15	28	403	121	1	0	57.4	94.0
MISSOURI	5,225	3,482	5,251	878	1,196	319	11	5	0	71.5	100.5
MONTANA	938	483	736	32	38	42	0	1	0	61.5	78.5
NEBRASKA	1,734	1,359	1,853	17	26	48	6	0	0	86.4	106.9
NEVADA	1,312	605	1,187	95	142	46	0	0	0	86.3	90.5
NEW HAMPSHIRE	1,306	442	943	59	203	336	255	58	33	49.9	72.2
NEW JERSEY	8,747	5,734	8,481	826	1,496	1,144	204	146	7	78.2	97.0
NEW MEXICO	1,781	861	1,538	16	30	121	43	6	1	69.4	86.4
NEW YORK	18,922	13,336	20,011	2,737	3,364	4,419	2,128	56	6	75.6	105.8
NORTH CAROLINA	7,419	2,443	4,484	179	441	1,499	847	103	14	43.6	60.4
NORTH DAKOTA	690	434	576	0	0	7	2	0	0	66.2	83.6
OHIO	12,031	8,442	12,018	76	94	997	79	3	0	78.7	99.9
OKLAHOMA	3,702	2,131	3,534	2	11	186	20	7	0	73.7	95.5
OREGON	3,209	1,420	2,986	40	73	334	1	3	0	56.2	93.1
PENNSYLVANIA	12,365	8,860	12,241	524	1,199	2,553	549	232	13	75.5	99.0
RHODE ISLAND	1,033	597	1,007	48	71	346	101	0	0	64.3	97.5
SOUTH CAROLINA	3,700	1,321	2,798	234	495	626	107	51	0	45.1	75.6
SOUTH DAKOTA	730	453	663	13	10	16	4	0	0	65.8	90.9
TENNESSEE	5,573	2,186	4,112	72	151	867	261	1	0	49.9	73.8
TEXAS	18,069	10,970	18,072	238	575	1,042	1	38	0	82.0	100.0
UTAH	1,688	1,160	1,683	6	38	93	3	5	0	84.9	99.7
VERMONT	607	233	385	48	78	114	78	15	7	47.3	63.5
VIRGINIA	6,755	3,271	5,930	137	263	1,231	540	6	0	62.9	87.8
WASHINGTON	4,859	2,360	4,326	440	815	594	97	28	19	60.1	89.0
WEST VIRGINIA	2,003	821	2,053	16	24	934	23	3	0	43.7	102.5
WISCONSIN	5,553	3,486	5,173	94	187	428	160	22	12	73.9	93.2
WYOMING	484	329	597	16	28	2	0	1	0	73.3	123.4
AMERICAN SAMOA	40	1	36	0	1	30	2	0	0	4.5	90.5
GUAM	275	72	215	9	3	18	22	0	0	63.9	78.5
N. MARIANAS	31	1	31	0	2	17	1	0	0	8.1	101.0
PUERTO RICO	4,700	1,824	3,242	0	0	1,117	771	0	0	54.3	69.0
PAC. TR. TERR.	174	22	108	0	4	95	64	0	0	20.6	62.2
VIRGIN ISLANDS	116	66	106	3	3	19	7	0	0	69.6	91.9
U.S. TOTALS	272,644	159,422	251,169	11,274	19,387	33,396	10,948	1,285	220	71.2	92.1

Table 43

Total Pipe Length Needed by Diameter

(Length in Meters, Diameter in Centimeters)

Table 43 summarizes, by State, the total length of sewer pipe in meters required by the year 2000. These figures include gravity sewer pipe and force main pipe lengths.

The lengths are separated into two categories, Type 1 and Type 2 estimates, and five diameter size ranges for each category. Type 1 information was obtained from actual preliminary engineering designs. Type 2 information was generally developed using EPA cost estimating procedures. The diameter size ranges are in centimeters (inches in parentheses).

Dollar needs by category and size range are summarized in Table 45.

	TYPE 1 ESTIMATES					TYPE 2 ESTIMATES				
STATE	0-47 (0"-18")	48-68 (19"-27")	69-123 (28"-48")	124-199 (49"-78")	200+ (79"+)	0-47 (0"-18")	48-68 (19"-27")	69-123 (28"-48")	124-199 (49"-78")	200+ (79"+)
ALABAMA	1,099,721	104,697	60,498	26,365		2,537,898	56,067	34,386		
ALASKA	191,799	15,508	4,147	3,907		99,806				
ARIZONA	366,287	94,716	127,469	15,288		1,061,996	15,501	81,613		
ARKANSAS	400,687	16,535	34,522	1,584		1,491,368	53,688	73,151		
CALIFORNIA	977,749	94,291	131,652	62,212	52,111	6,075,327	490,131	733,444	157,926	
COLORADO	31,883	24,240	58,752	56,583		381,497	102,139	141,162	65,815	
CONNECTICUT	534,483	15,270	23,023			1,881,553	99,236	22,786		
DELAWARE	128,020	2,924				203,004	2,804	63,523		
DIST. OF COLUM.										
FLORIDA	2,111,672	542,543	589,050	95,049	24,620	7,308,967	263,752	265,535	181,347	
GEORGIA	1,033,942	377,057	251,256	101,124	10,503	2,588,573	44,180	74,814	37,965	
HAWAII	133,802	15,560	10,420			717,710	27,106	120,291		
IDAHO	254,426	12,161	5,333			734,098	55,312	34,259		
ILLINOIS	1,493,459	106,602	110,912	11,987		655,679	25,859	19,495		
INDIANA	1,077,492	107,365	58,213			1,174,288	33,216	18,118		
IOWA	599,635	66,269	101,953	5,151		933,919	31,555	19,777	12,953	
KANSAS	735,938	203,940	89,955			651,085	20,986	20,087	3,591	
KENTUCKY	2,627,076	67,536	196,905	44,039		1,718,198	14,802			
LOUISIANA	2,117,307	196,420	66,293			1,416,794	74,212	65,311		
MAINE	1,066,337	12,781	3,657			776,599	8,717			
MARYLAND	310,286	3,993	822			1,423,217	119,544	244,729	21,288	
MASSACHUSETTS	3,352,021	392,604	131,466	19,283	1,478	1,557,940	55,376	36,935		
MICHIGAN	3,498,235	76,013	101,467	64,943	16,818	1,959,823	86,320	38,546		
MINNESOTA	499,265	54,315	47,774	35,478	62,788	1,104,339	63,763			
MISSISSIPPI	1,442,169	124,215	203,296			775,319	39,969	25,859		
MISSOURI	1,787,977	100,220	89,175	81,082		999,400	26,501	13,556		
MONTANA	218,970	26,581	11,021	1,219		125,795		8,153		
NEBRASKA	69,480	28,340	39,280	8,991		244,183	6,635	15,483		
NEVADA	133,419	9,052	4,614	2,569		240,592	24,039			
NEW HAMPSHIRE	1,190,245	102,098	10,568			1,365,611	16,762			
NEW JERSEY	764,052	83,203	121,693	28,346	21,322	3,885,588	146,972	89,840		
NEW MEXICO	212,121	17,862	31,366	1,042		386,057	7,407	20,690		
NEW YORK	2,178,176	92,126	163,415	68,519	9,832	6,273,935	112,127	209,703	169,416	
NORTH CAROLINA	3,503,970	377,081	313,014	34,411		3,559,167	18,652	13,161		
NORTH DAKOTA	33,118	16,628	2,182	9,826		22,954				
OHIO	2,349,850	240,460	375,769	119,780	46,024	2,478,258	136,136	126,964	7,019	
OKLAHOMA	536,800	24,383	76,105	45,011		976,461	154,668	53,859		
OREGON	301,844	62,147	60,494			864,626	64,347	63,927	62,551	
PENNSYLVANIA	1,453,271	26,715	8,397	3,188		8,048,581	164,422	146,427		
RHODE ISLAND	296,681	12,868	20,909			815,675	41,026		29,002	
SOUTH CAROLINA	1,791,430	166,995	108,604			2,516,772	46,666			
SOUTH DAKOTA	149,712	29,409				32,588				
TENNESSEE	2,542,042	204,200	118,950	33,863	20,253	2,092,379	28,518			
TEXAS	1,498,244	105,975	63,387	33,976	5,882	5,963,631	446,671	418,089	442,769	17,190
UTAH	328,236	25,408				559,299	32,975	19,946		
VERMONT	193,419	435				371,004	10,903			
VIRGINIA	1,943,640	158,602	237,220	18,416		2,317,193	120,294	133,052		2,773
WASHINGTON	993,584	309,106	96,786	57,424		2,099,190	93,254	121,515		
WEST VIRGINIA	2,054,223	16,885				3,412,975	24,227	6,800		
WISCONSIN	798,186	95,785	89,622	304		1,516,432	48,734	17,241		
WYOMING	95,348		8,317			31,516	15,544	24,206		
AMERICAN SAMOA	49,615		77,504			2[illegible],726				
GUAM	8,129	1,301								
N. MARIANAS	70,469					99,517				
PUERTO RICO	1,068,291	248,579	299,882	8,606		599,334	10,024	26,060		
PAC. TR. TERR.	139,875					99,021				
VIRGIN ISLANDS	1,021	2,081				104,078	3,770	8,369		
U.S. TOTALS	54,839,159	5,310,104	4,877,135	1,099,979	271,638	91,351,558	3,585,532	3,672,421	1,212,029	[illegible]

NOTE: 1. PIPE CATEGORIES ARE DIAMETER IN CENTIMETERS (INCHES IN PARATHESES).

Length and Cost of Pipe Needed by the Year 2000

(Length in Kilometers, Mean Cost in Dollars/Meter)

Table 44 summarizes, by State, the total length in kilometers of collector (CS), interceptor (IS), and force main (FM) pipe required by the year 2000. Also summarized is the mean cost (dollars per meter) for each type of pipe. The mean cost for interceptor pipe has been subdivided into three diameter size ranges. The ranges are given in centimeters (maximum diameter in inches in parentheses).

The data has been separated into two general categories, Type 1 and Type 2 estimates. Type 1 information was obtained from actual preliminary engineering designs. Type 2 information was generally developed using EPA cost estimating procedures.

All costs are in January 1980 dollars.

	TYPE 1 ESTIMATES								TYPE 2 ESTIMATES							
	LENGTH			MEAN COST					LENGTH			MEAN COST				
STATE	CS.	IS.	FM.	CS.	IS.			FM.	CS.	IS.	FM.	CS.	IS.			FM.
					0-68 (27")	69-123 (48")	124+ (49"+)						0-68 (27")	69-123 (48")	124+ (49"+)	
ALABAMA	355	721	215	122	120	162	1307	89	2,401	225	1	100	221	664	0	82
ALASKA	65	145	4	228	520	1724	4678	836	88	11	0	313	375	0	0	0
ARIZONA	115	471	16	90	124	593	658	86	984	174	0	120	179	573	0	0
ARKANSAS	196	131	125	63	108	353	424	64	1,281	289	46	88	160	521	0	59
CALIFORNIA	567	666	84	145	276	575	2029	172	5,509	1,888	58	217	359	835	2351	300
COLORADO	0	167	3	0	271	469	1189	227	216	494	0	99	218	561	1236	0
CONNECTICUT	358	177	36	237	296	679	0	247	1,761	229	12	224	378	618	0	333
DELAWARE	61	17	52	142	315	0	0	91	179	82	6	139	279	952	0	87
DIST. OF COLUM.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
FLORIDA	39	1,529	1,794	135	261	399	1364	129	7,062	809	147	178	280	682	1375	317
GEORGIA	231	1,335	206	61	118	395	460	125	2,407	318	19	93	167	445	1267	261
HAWAII	57	81	20	236	432	1580	0	552	688	176	0	359	706	1340	0	0
IDAHO	129	104	37	108	191	779	0	93	636	186	0	134	263	660	0	780
ILLINOIS	954	574	193	106	202	1003	1806	114	524	168	7	149	305	653	0	204
INDIANA	665	405	171	188	201	840	0	73	1,053	172	0	164	274	742	0	0
IOWA	286	370	115	98	205	653	963	89	744	237	16	114	202	650	1234	75
KANSAS	239	725	64	146	299	666	0	112	574	117	3	126	184	624	1645	155
KENTUCKY	1,136	1,337	462	125	164	534	1731	81	1,589	116	26	231	189	0	0	38
LOUISIANA	1,214	487	677	111	138	334	0	84	1,274	270	11	138	282	560	0	147
MAINE	576	299	206	188	276	446	0	125	697	73	14	132	190	0	0	106
MARYLAND	126	105	82	131	138	1419	0	88	1,276	501	30	161	332	769	1242	1602
MASSACHUSETTS	2,696	949	250	219	316	872	1225	172	1,450	182	17	174	343	661	0	136
MICHIGAN	2,513	926	357	176	234	798	3073	99	1,835	249	0	146	323	578	0	0
MINNESOTA	180	302	216	151	213	841	2280	128	940	220	6	128	243	0	0	132
MISSISSIPPI	598	753	418	80	120	304	0	114	658	174	8	85	152	621	0	15
MISSOURI	623	1,009	425	125	207	619	2251	308	816	198	24	182	194	697	0	157
MONTANA	44	176	36	98	125	355	971	84	105	28	0	84	115	355	0	0
NEBRASKA	7	111	27	83	241	397	924	49	192	73	0	97	163	882	0	87
NEVADA	103	46	0	80	273	779	779	0	218	46	0	145	360	0	0	0
NEW HAMPSHIRE	613	532	156	198	259	265	0	163	971	321	89	157	230	0	0	120
NEW JERSEY	426	399	192	209	568	736	6411	658	3,743	284	95	169	444	722	0	796
NEW MEXICO	123	137	1	71	141	301	603	114	336	77	0	81	135	375	0	0
NEW YORK	1,449	778	283	290	321	610	3342	216	5,670	975	119	326	288	1067	2166	161
NORTH CAROLINA	1,077	2,365	784	100	120	329	501	102	3,285	264	40	85	111	338	0	40
NORTH DAKOTA	16	22	22	87	271	679	293	176	11	11	0	79	81	0	0	0
OHIO	1,518	1,441	172	175	265	464	542	161	2,256	483	8	189	339	849	2395	135
OKLAHOMA	276	328	77	54	103	322	438	89	961	221	1	126	171	451	0	30
OREGON	158	244	21	138	274	879	0	230	779	274	0	302	327	944	1458	105
PENNSYLVANIA	1,026	352	112	166	380	1007	3235	175	7,398	955	5	151	271	719	0	1124
RHODE ISLAND	248	79	2	267	289	351	0	238	770	101	14	276	352	0	1406	226
SOUTH CAROLINA	173	1,346	547	119	104	220	0	73	2,328	207	27	93	206	0	0	96
SOUTH DAKOTA	15	104	58	95	183	0	0	41	19	13	0	78	84	0	0	0
TENNESSEE	761	1,665	492	98	152	444	765	114	2,005	109	5	157	281	0	0	84
TEXAS	590	761	356	68	112	430	773	42	5,107	2,133	46	109	215	564	1395	411
UTAH	102	244	4	118	89	0	0	48	439	173	0	97	180	505	0	0
VERMONT	132	35	26	194	282	0	0	146	322	38	20	138	278	0	0	102
VIRGINIA	1,059	744	553	109	137	417	1598	188	2,175	393	4	100	201	566	188	133
WASHINGTON	451	927	77	342	330	995	997	229	1,934	374	4	173	304	802	0	167
WEST VIRGINIA	1,412	409	249	120	163	0	0	69	3,212	228	5	105	169	431	0	184
WISCONSIN	417	445	120	141	838	1416	1437	101	1,404	178	0	138	285	504	0	82
WYOMING	1	94	8	70	107	277	0	62	9	61	0	79	162	690	0	0
AMERICAN SAMOA	49	77	0	123	0	325	0	0	19	1	0	202	203	0	0	0
GUAM	0	2	6	0	310	0	0	340	0	0	0	0	0	0	0	0
N. MARIANAS	0	70	0	0	267	0	0	0	99	0	0	202	0	0	0	0
PUERTO RICO	646	766	212	188	176	392	1856	161	593	41	0	389	533	1094	0	0
PAC. TR. TERR.	94	33	12	182	283	0	0	217	92	6	0	202	334	0	0	0
VIRGIN ISLANDS	0	1	2	0	746	0	0	812	98	17	0	140	539	571	0	0
U.S. TOTALS	26,989	28,544	10,864	159	210	541	1592	135	83,218	15,670	952	165	262	741	1614	300

NOTES: 1. PIPE CATEGORIES ARE COLLECTOR (CS.), INTERCEPTOR (IS.), AND FORCE MAIN (FM.).

2. INTERCEPTOR PIPE CATEGORIES ARE DIAMETER IN CENTIMETERS (MAXIMUM INCHES IN PARATHESES).

Table 45

Dollar Needs for All Pipe Size Categories by Diameter

(Thousands of 1980 Dollars)

Table 45 summarizes, by State, the total dollar needs for all pipe required by the year 2000. Dollar needs are included for gravity sewer pipe and force main pipe. Table 45 is an extension of Table 43.

The dollar needs are separated into two categories, Type 1 and Type 2 estimates, and five diameter size ranges for each category. Type 1 information was obtained from actual preliminary engineering designs. Type 2 information was generally developed using EPA cost estimating procedures. The diameter size ranges are in centimeters (inches in parentheses).

It is noted that almost 65 percent of the dollar needs are for pipes with a diameter less than or equal to 47 centimeters (18 inches).

	TYPE 1 ESTIMATES					TYPE 2 ESTIMATES				
STATE	0-47 (0"-18")	48-68 (19"-27")	69-123 (28"-48")	124-199 (49"-78")	200+ (79"+)	0-47 (0"-18")	48-68 (19"-27")	69-123 (28"-48")	124-199 (49"-78")	200+ (79"+)
ALABAMA	105,878	26,466	9,969	29,820		262,442	21,697	22,861		
ALASKA	78,519	11,591	7,151	18,280		31,986				
ARIZONA	36,490	16,192	75,603	10,074		129,272	5,719	46,765		
ARKANSAS	24,627	3,097	11,812	673		135,044	16,348	38,157		
CALIFORNIA	179,176	34,545	75,697	93,811	138,200	1,325,418	248,548	603,346	371,381	
COLORADO	6,375	8,671	27,592	67,292		47,467	32,498	79,302	106,153	
CONNECTICUT	132,436	7,662	15,636			434,228	42,002	14,562		
DELAWARE	17,191	1,850				29,512	1,520	60,495		
DIST. OF COLUM.										
FLORIDA	299,976	157,630	183,825	143,745	19,487	1,295,705	97,178	186,864	249,478	
GEORGIA	97,236	56,349	97,425	33,354	7,019	249,529	13,447	33,040	48,113	
HAWAII	40,136	15,681	16,471			265,029	21,913	161,272		
IDAHO	30,702	5,863	4,160			100,405	25,743	22,615		
ILLINOIS	179,408	35,403	109,551	21,651		111,859	13,414	12,732		
INDIANA	180,852	27,309	48,907			198,751	17,149	13,461		
IOWA	72,046	20,828	66,677	4,963		113,543	14,090	12,870	15,995	
KANSAS	149,284	83,175	59,983			84,362	6,447	12,554	5,911	
KENTUCKY	324,353	30,753	101,509	76,940		385,290	6,345			
LOUISIANA	206,301	31,252	30,848			203,479	32,735	36,634		
MAINE	211,636	4,608	1,634			104,111	3,597			
MARYLAND	36,890	1,618	1,168			239,733	53,704	189,730	47,336	
MASSACHUSETTS	719,889	165,125	111,715	21,535	3,916	279,087	25,561	24,429		
MICHIGAN	617,276	24,457	107,194	76,637	174,684	296,113	41,562	22,286		
MINNESOTA	67,386	20,198	38,277	31,210	192,932	147,055	28,789			
MISSISSIPPI	121,037	25,217	68,886			67,455	11,269	16,066		
MISSOURI	289,908	34,265	58,105	180,667		177,781	10,618	9,455		
MONTANA	21,026	7,129	3,922	1,184		11,288		2,898		
NEBRASKA	8,357	8,769	15,620	8,316		26,058	2,264	13,663		
NEVADA	15,528	3,420	3,596	2,003		37,807	10,624			
NEW HAMPSHIRE	236,371	46,620	2,811			229,970	7,711			
NEW JERSEY	264,903	45,096	98,826	44,428	150,922	683,626	95,380	72,217		
NEW MEXICO	19,456	4,408	9,445	629		33,202	2,015	7,769		
NEW YORK	600,056	87,975	107,146	209,371	52,496	1,988,245	51,281	223,210	367,050	
NORTH CAROLINA	343,053	73,097	106,598	17,272		306,026	5,081	4,449		
NORTH DAKOTA	3,699	4,688	1,483	2,886		1,644				
OHIO	449,506	88,005	174,724	35,074	54,824	477,351	70,341	107,918	18,257	
OKLAHOMA	35,842	6,822	24,374	19,755		105,042	45,328	24,292		
OREGON	52,517	24,046	52,401			255,264	29,299	60,349	90,935	
PENNSYLVANIA	302,642	15,782	8,801	10,319		1,267,701	80,661	103,417		
RHODE ISLAND	79,632	4,195	7,342			224,857	16,546		40,801	
SOUTH CAROLINA	159,013	31,870	24,464			236,865	26,993			
SOUTH DAKOTA	13,017	10,050				2,643				
TENNESSEE	298,203	53,042	52,977	16,404	25,037	328,278	17,997			
TEXAS	107,312	22,138	27,261	26,853	3,983	687,220	153,441	236,225	616,479	25,539
UTAH	80,642	3,686				59,175	11,281	10,088		
VERMONT	59,263	273				52,256	5,250			
VIRGINIA	209,468	32,583	105,069	26,166		235,877	34,888	75,427		524
WASHINGTON	288,533	139,732	96,388	57,291		369,296	44,351	97,531		
WEST VIRGINIA	289,598	5,126				367,308	8,803	3,801		
WISCONSIN	128,137	241,777	126,935	438		215,484	24,857	8,703		
WYOMING	9,853		2,306			3,582	3,279	16,750		
AMERICAN SAMOA	6,134		25,224			4,202				
GUAM	2,211	916								
N. MARIANAS	18,856					20,165				
PUERTO RICO	192,788	44,597	117,834	15,983		232,669	6,825	28,515		
PAC. TR. TERR.	29,269					20,947				
VIRGIN ISLANDS	762	1,691				16,241	2,701	4,783		
U.S. TOTALS	8,436,853	1,817,338	2,525,342	1,305,028	823,500	15,215,145	1,549,090	2,721,501	1,977,889	26,063

NOTE: 1. PIPE CATEGORIES ARE DIAMETER IN CENTIMETERS (INCHES IN PARATHESES).

Table 46

Number, Capacity, and Cost of New Pump Stations

(Thousands of 1980 Dollars)

Table 46 summarizes, by State, the pump station requirements by the year 2000. The summary presents the number of pump stations required and the total average daily pumping capacity (thousands of cubic meters per day) they represent. Also summarized is the total dollar need and the mean cost per station (thousands of 1980 dollars).

The data have been separated into two general categories, Type 1 and Type 2 estimates. Type 1 information was obtained from actual preliminary engineering designs. Type 2 information was generally developed using EPA cost estimating procedures.

STATE	TYPE 1 ESTIMATES				TYPE 2 ESTIMATES			
	NUMBER OF STATIONS	TOTAL CAPACITY (KCMD)	TOTAL COST	MEAN COST	NUMBER OF STATIONS	TOTAL CAPACITY (KCMD)	TOTAL COST	MEAN COST
ALABAMA	191	594	21,073	110	75	303	11,476	153
ALASKA	13	61	1,140	87	0	0	0	0
ARIZONA	18	31	1,089	60	31	139	5,262	169
ARKANSAS	109	248	5,608	51	45	99	6,311	140
CALIFORNIA	132	4,472	71,203	539	387	1,885	110,076	284
COLORADO	1	0	103	103	19	75	2,930	154
CONNECTICUT	74	315	20,226	273	60	472	15,741	262
DELAWARE	44	21	10,880	247	12	48	2,753	229
DIST. OF COLUM.	0	0	0	0	0	0	0	0
FLORIDA	1,925	11,393	361,398	187	317	893	35,328	111
GEORGIA	179	1,277	43,084	240	44	532	8,921	202
HAWAII	17	456	24,029	1,413	38	174	14,470	380
IDAHO	128	49	3,235	25	17	70	3,272	192
ILLINOIS	223	518	25,218	113	16	80	4,028	251
INDIANA	229	138	18,778	82	39	125	7,389	189
IOWA	137	560	18,964	138	28	63	4,677	167
KANSAS	155	146	11,495	74	11	40	2,117	192
KENTUCKY	913	1,164	82,477	90	49	77	3,275	66
LOUISIANA	702	709	94,040	133	54	240	10,770	199
MAINE	265	123	35,560	134	33	52	4,096	124
MARYLAND	181	82	7,026	38	80	1,257	21,447	268
MASSACHUSETTS	410	1,801	121,749	296	63	227	14,113	224
MICHIGAN	414	508	41,017	99	62	268	13,746	221
MINNESOTA	311	383	13,790	44	33	132	6,402	194
MISSISSIPPI	305	995	25,329	83	36	33	1,137	31
MISSOURI	742	1,594	110,397	148	36	64	3,831	106
MONTANA	20	35	1,946	97	3	10	342	114
NEBRASKA	29	65	2,346	80	5	4	748	149
NEVADA	5	14	899	179	4	19	777	194
NEW HAMPSHIRE	163	310	36,375	223	130	149	25,393	195
NEW JERSEY	118	1,258	93,760	794	158	854	52,677	333
NEW MEXICO	11	85	1,651	150	8	36	1,202	150
NEW YORK	392	1,010	92,975	237	544	2,007	154,284	283
NORTH CAROLINA	588	1,959	76,465	130	63	193	6,132	97
NORTH DAKOTA	43	35	1,824	42	1	1	49	49
OHIO	313	696	52,693	168	90	322	20,823	231
OKLAHOMA	107	471	12,928	120	17	61	2,215	130
OREGON	48	206	10,625	221	64	284	15,791	246
PENNSYLVANIA	142	151	31,592	222	243	1,164	57,464	236
RHODE ISLAND	25	111	10,366	414	55	176	9,780	177
SOUTH CAROLINA	538	1,481	67,979	126	41	111	4,962	121
SOUTH DAKOTA	67	85	3,258	48	4	0	188	47
TENNESSEE	422	2,462	66,380	157	27	105	3,662	135
TEXAS	613	691	21,059	34	188	974	36,994	196
UTAH	13	25	801	61	4	21	645	161
VERMONT	76	28	7,920	104	43	28	5,793	134
VIRGINIA	389	1,102	69,722	179	208	509	14,824	71
WASHINGTON	136	718	82,927	609	110	311	21,921	199
WEST VIRGINIA	330	4,328	25,521	77	228	533	20,745	90
WISCONSIN	151	216	12,466	82	106	191	9,153	86
WYOMING	9	2	386	42	0	0	0	0
AMERICAN SAMOA	0	0	0	0	0	0	0	0
GUAM	8	79	1,496	187	0	0	0	0
N. MARIANAS	3	4	6,690	2,230	0	0	0	0
PUERTO RICO	287	346	69,440	241	22	101	5,118	232
PAC. TR. TERR.	77	8	5,070	65	2	10	774	387
VIRGIN ISLANDS	6	4	565	94	7	19	1,676	239
U.S. TOTALS	12,947	45,653	2,037,025	157	3,960	15,572	787,700	198

NOTE: 1. PUMP STATION CAPACITY IN THOUSANDS OF CUBIC METERS PER DAY (KCMD).

Table 47

Number of Facilities Needing Collector Sewers by Service Area Population and Per Capita Sewer Cost

Table 47 summarizes, for the nation, the number of communities having collector sewer needs.

The summary is presented in matrix form. The matrix delineates the number of communities needing collectors by service area population and dollar needs per capita. The percentages (%) listed represent the percent of the national total number of communities needing collectors that are contained in each category. Categories with zero percent represent less than 0.1 percent of the national total.

The matrix also lists totals by service area and dollar needs per capita categories.

There are 14,394 communities in the nation that need collector sewers. Communities with service area population less than 1,000 account for 51.1 percent of the national total.

Communities with per capita needs between $501 and $600 account for 18.3 percent of the national total.

All costs are in January 1980 dollars.

The service area populations were based on the total 1980 resident population in a community.

The population in a community that met the qualifications of the "2/3 Rule" was used to calculate the dollar per capita value. The 2/3 rule states that two-thirds of the population requiring collector sewers in 1980 are required to have been residents of the service area on October 18, 1972.

A related summary is presented in Table 48.

COLLECTOR SEWER COST	TOTAL		SERVICE-AREA POPULATION 0-999		1,000-4,999		5,000-9,999		10,000-49,999		50K-100K		>100K	
$/CAPITA	NUMBER	%	NUMBER	%	NUMBER	%	NUMBER	%	NUMBER	%	NUMBER	%	NUMBER	%
0-100	423	2.9	222	1.5	109	0.7	29	0.2	49	0.3	7	0.0	7	0.0
101-200	186	1.2	33	0.2	62	0.4	36	0.2	46	0.3	7	0.0	2	0.0
201-300	479	3.3	222	1.5	163	1.1	47	0.3	40	0.2	4	0.0	3	0.0
301-400	2,307	16.0	1,416	9.8	612	4.2	131	0.9	131	0.9	11	0.0	6	0.0
401-500	2,553	17.7	1,518	10.5	682	4.7	169	1.1	157	1.0	19	0.1	8	0.0
501-600	2,644	18.3	1,393	9.6	797	5.5	183	1.2	228	1.5	21	0.1	22	0.1
601-700	1,200	8.3	603	4.1	356	2.4	89	0.6	130	0.9	10	0.0	12	0.0
701-800	1,897	13.1	752	5.2	715	4.9	166	1.1	214	1.4	31	0.2	19	0.1
801-900	859	5.9	327	2.2	277	1.9	89	0.6	133	0.9	23	0.1	10	0.0
901-1000	500	3.4	192	1.3	166	1.1	63	0.4	67	0.4	6	0.0	6	0.0
1001-1100	168	1.1	71	0.4	52	0.3	9	0.0	31	0.2	3	0.0	2	0.0
1101-1200	143	0.9	77	0.5	27	0.1	14	0.0	22	0.1	3	0.0	0	0.0
1201-1300	167	1.1	95	0.6	44	0.3	7	0.0	16	0.1	2	0.0	3	0.0
1301-1400	102	0.7	55	0.3	26	0.1	8	0.0	11	0.0	1	0.0	1	0.0
1401-1500	84	0.5	45	0.3	26	0.1	4	0.0	7	0.0	1	0.0	1	0.0
>1500	682	4.7	346	2.4	231	1.6	47	0.3	52	0.3	4	0.0	2	0.0
TOTAL	14,394	100.0	7,367	51.1	4,345	30.1	1,091	7.5	1,334	9.2	153	1.0	104	0.7

Table 48

Percent of Dollar Needs for Collector Sewers by Service Area Population and Per Capita Cost

Table 48 summarizes, for the nation, the distribution of dollar needs for collector sewers.

The summary is presented in matrix form. The matrix delineates the distribution of the national collector dollar need by service area population and dollar need per capita. The matrix also shows what percent of a population groups' total need is included in a particular dollar per capita range.

Communities with service area populations less than 1,000 account for 10.9 percent of the total national collector sewer dollar need.

Communities with per capita needs between $701 and $800 account for 17.4 percent of the national total.

The national dollar need for collector sewers is approximately $18 billion (January 1980 dollars).

The service area populations were based on the total 1980 resident population in a community.

The population in a community that met the qualifications of the "2/3 Rule" was used to calculate the dollar per capita value. The 2/3 Rule states that two-thirds of the population requiring collector sewers in 1980 are required to have been residents of the service area on October 18, 1972.

Table 48 is an extension of Table 47.

COLLECTOR SEWER COST	TOTAL	SERVICE-AREA POPULATION 0-999		1,000-4,999		5,000-9,999		10,000-49,999		50K-100K		>100K	
$/CAPITA	% OF NATL. TOTAL COST	% OF POP. GROUP COST	% OF NATL. TOTAL COST	% OF POP. GROUP COST	% OF NATL. TOTAL COST	% OF POP. GROUP COST	% OF NATL. TOTAL COST	% OF POP. GROUP COST	% OF NATL. TOTAL COST	% OF POP. GROUP COST	% OF NATL. TOTAL COST	% OF POP. GROUP COST	% OF NATL. TOTAL COST
0-100	1.3	1.8	0.2	1.4	0.3	1.3	0.1	1.0	0.3	0.5	0.0	1.5	0.2
101-200	1.0	0.1	0.0	0.3	0.0	1.1	0.1	1.6	0.5	1.3	0.1	1.0	0.1
201-300	1.4	1.1	0.1	1.1	0.2	1.6	0.2	1.2	0.3	3.3	0.2	1.1	0.1
301-400	5.5	9.0	0.9	5.4	1.3	5.7	0.7	5.8	1.7	4.2	0.3	2.6	0.3
401-500	8.1	13.1	1.4	8.7	2.1	10.0	1.2	7.7	2.3	8.6	0.6	1.9	0.2
501-600	15.5	16.1	1.7	14.9	3.6	16.1	2.0	15.5	4.6	16.7	1.2	15.1	2.1
601-700	8.1	8.8	0.9	8.5	2.0	6.5	0.8	8.2	2.5	3.2	0.2	10.5	1.5
701-800	17.4	13.7	1.5	20.2	4.9	17.0	2.1	13.9	4.2	29.2	2.1	17.1	2.4
801-900	11.0	6.8	0.7	10.0	2.4	12.6	1.6	10.5	3.1	10.3	0.7	16.1	2.3
901-1000	10.7	4.7	0.5	7.0	1.7	11.9	1.5	10.3	3.1	10.3	0.7	21.6	3.1
1001-1100	2.4	1.6	0.1	2.2	0.5	1.2	0.1	3.7	1.1	3.2	0.2	1.6	0.2
1101-1200	1.9	2.1	0.2	1.0	0.2	1.9	0.2	3.3	1.0	2.4	0.1	0.0	0.0
1201-1300	2.0	2.1	0.2	2.0	0.4	1.3	0.1	2.9	0.9	0.2	0.0	1.2	0.1
1301-1400	1.3	1.6	0.1	1.0	0.2	1.5	0.1	1.7	0.5	1.1	0.0	0.5	0.0
1401-1500	1.0	1.5	0.1	1.1	0.2	0.6	0.0	1.2	0.3	0.7	0.0	0.7	0.1
>1500	10.7	15.2	1.6	14.4	3.5	8.9	1.1	10.6	3.2	4.1	0.3	6.6	0.9
TOTAL	100.0	100.0	10.9	100.0	24.4	100.0	12.6	100.0	30.1	100.0	7.4	100.0	14.3

Table 49

Total Estimated I/I Flow to Treatment Plants—I/I That is Cost Effective to Remove

Table 49 summarizes, by State, the infiltration/inflow (I/I) quantities which are cost effective to eliminate from conveyance systems, rather than provide treatment.

The number of Plants is a summation of the plants within a State from which some I/I flow will be eliminated.

The total Estimated I/I Flow is the summation of I/I flows per State which are cost effective to eliminate.

The Existing Flow is the summation of the total average daily flow being received at the plants listed in the first column.

The Present Design Flow (PRES DES FLOW) is the summation of the 1980 design treatment capacity of the plants listed in the first column.

Only facilities being served by separate type sewer systems are included in this summary.

All flows are given in thousands of cubic meters per day.

Tables 50 and 51 present summaries related to Table 49.

STATE	PLANTS	ESTIMATED I/I FLOW	EXISTING FLOW	PRES DES FLOW
ALABAMA	113	445,94	773,42	1,001,35
ALASKA	6	69,64	90,99	128,87
ARIZONA	4	5,07	11,96	10,56
ARKANSAS	39	178,84	195,45	236,94
CALIFORNIA	34	567,22	2,287,35	2,919,97
COLORADO	39	56,32	97,57	135,42
CONNECTICUT	18	131,90	314,94	406,96
DELAWARE	3	3,78	289,21	379,25
DIST. OF COLUM.	1	26,23	1,127,92	1,169,56
FLORIDA	74	267,52	1,151,13	2,056,76
GEORGIA	157	346,63	981,82	1,429,02
HAWAII	0	0,00	0,00	0,00
IDAHO	35	24,11	92,84	126,41
ILLINOIS	149	672,78	5,937,68	6,996,87
INDIANA	54	84,82	651,09	1,041,29
IOWA	179	236,63	713,43	813,39
KANSAS	67	128,84	281,07	358,36
KENTUCKY	113	224,63	713,05	886,37
LOUISIANA	59	256,77	347,16	498,10
MAINE	16	45,68	140,49	169,75
MARYLAND	21	51,36	161,92	274,82
MASSACHUSETTS	24	80,43	2,023,80	2,068,69
MICHIGAN	60	131,03	3,447,49	4,155,62
MINNESOTA	123	150,30	1,084,74	1,237,80
MISSISSIPPI	109	252,04	508,85	616,19
MISSOURI	85	281,52	625,35	765,28
MONTANA	8	3,44	8,51	6,54
NEBRASKA	25	6,66	18,39	14,00
NEVADA	5	5,71	9,38	18,09
NEW HAMPSHIRE	13	25,88	118,05	248,67
NEW JERSEY	44	293,48	2,448,70	2,713,23
NEW MEXICO	0	0,00	0,00	0,00
NEW YORK	107	608,85	2,590,64	2,961,53
NORTH CAROLINA	171	210,90	1,261,80	1,846,66
NORTH DAKOTA	2	0,68	4,01	7,04
OHIO	136	666,27	3,431,25	4,275,87
OKLAHOMA	38	69,37	173,23	179,93
OREGON	53	157,19	511,58	782,77
PENNSYLVANIA	32	76,72	1,150,33	1,153,47
RHODE ISLAND	5	26,23	281,71	317,59
SOUTH CAROLINA	111	346,02	676,68	973,35
SOUTH DAKOTA	10	3,21	21,27	27,66
TENNESSEE	142	301,92	1,241,85	1,782,35
TEXAS	213	909,53	2,431,63	2,823,15
UTAH	23	182,32	527,59	644,69
VERMONT	7	4,35	14,23	18,58
VIRGINIA	31	94,58	241,74	346,70
WASHINGTON	46	585,16	728,61	831,56
WEST VIRGINIA	10	23,54	27,81	27,40
WISCONSIN	126	1,298,70	1,542,99	2,191,02
U.S. TOTALS	2,940	10,620,93	43,512,92	51,884,70

Table 50

Required I/I Correction Actions—Facilities Where Correction is Cost Effective

Table 50 summarizes, for those facilities requiring infiltration/inflow corrective action, the kind of corrective action necessary and the basis of estimate for such action.

Individual cost estimates made in Category III are to be accompanied by a basis of estimate so that the accuracy of the estimate can be ascertained. EPA has determined that the quality of the cost estimates can be ranked from high to low as follows:

1. Engineer/Consultant Firm Estimate
2. Evaluation Survey Completed
3. Engineer/Consultant Preliminary Estimate
4. Infiltration/Inflow (I/I) Analysis Completed
5. Cost Effective Analysis
6. Cost of Previous Comparable Construction
7. EPA Supplied Cost Estimating Procedures
8. State Certification
9. No Basis Given

Only separate type sewer systems are included in this summary. Separate sewer systems are designed to convey wastewater from domestic and industrial sources but not stormwater runoff.

Table 50 is an expansion of the data presented in Table 49.

It is noted that basis of estimates are given for 3,329 facilities which is slightly more than the number of facilities listed on Table 49. This is because Table 49 only includes treatment facilities and Table 50 includes treatment and collection facilities which have I/I flow that is cost effective to eliminate.

Basis of Estimate	Total	Corrective Action Not known	Seal Sewer Lines	Replace or Recline Sewer Sections	Change or Create Flow Routing System	Provide Flow Equalization	Other
STATE CERTIFICATION	0	0	0	0	0	0	0
I/I ANALYSIS COMPLETED	1,685	46	1,006	567	4	10	52
EVALUATION SURVEY COMPLETED	291	8	104	159	1	2	17
ENGINEER/CONSULTANT FIRM ESTIMATE	20	1	3	15	0	0	1
COST OF PREVIOUS COMPARABLE CONSTRUCTION	0	0	0	0	0	0	0
ENGINEER/CONSULTANT PRELIMINARY ESTIMATE	572	41	195	307	1	8	20
EPA - SUPPLIED COST ESTIMATING PROCEDURES	680	334	206	117	2	0	21
COST EFFECTIVE ANALYSIS	81	14	37	24	0	1	5
(NO BASIS GIVEN)	0	0	0	0	0	0	0
TOTALS	3,329	444	1,551	1,189	8	21	116

Table 51

Dollar Needs for I/I Correction—Facilities Where Correction is Cost Effective

(Thousands of 1980 Dollars)

Table 51 summarizes, for the nation, the dollar needs required for infiltration/inflow corrective actions by basis of estimate. Table 51 is a direct extension of Table 50.

Only dollar needs for I/I correction for facilities served by separate type sewer systems are included.

All needs are given in thousands of January 1980 dollars.

Table 52

Facilities Requiring Major Rehabilitation—By Basis of Estimate

Table 52 summarizes, for the nation, the number of collection systems requiring major rehabilitation by type of corrective action and basis of estimate.

Individual cost estimates made in Category III are to be accompanied by a basis of estimate so that the accuracy of the estimate can be ascertained. EPA has determined that the quality of the cost estimates can be ranked from high to low as follows:

1. Engineer/Consultant Firm Estimate
2. Evaluation Survey Completed
3. Engineer/Consultant Preliminary Estimate
4. Infiltration/Inflow (I/I) Analysis Completed
5. Cost Effective Analysis
6. Cost of Previous Comparable Construction
7. EPA Supplied Cost Estimating Procedure
8. State Certification
9. No Basis Given

Table 53

Dollar Needs for Major Rehabilitation—By Basis of Estimate

(Thousands of Dollars)

Table 53 summarizes, for the nation, the dollar needs for collection systems requiring major rehabilitation by type of corrective action and basis of estimate.

Table 53 is a direct extension of Table 52.

Chapter IV

Summaries for Combined Sewer Overflow and Stormwater Runoff Technical Data (Categories V and VI)

Technical data collection for Categories V and VI of the 1980 Needs Survey was performed using the combined sewer system worksheet which is described in Appendix D of this report. As with the 1978 Survey, data collected for Categories V and VI was done in conjunction with data collected for Categories I-IV.

The technical data summaries presented in the 7 tables which follow were compiled from two sources. The first source was the National Combined Sewer System Data File, which represents the inventory of combined sewer data identified from readily available sources during the 1980 Survey. These data items include total combined sewer area, population served, and the types of receiving waters to which combined sewer overflow (CSO) is discharged. The second source was the Urbanized Area Data Base, which was required to estimate treatment needs for urban stormwater runoff (SWR) as well as CSO. In addition, the Urbanized Area Data Base includes data developed by the Needs Estimation Program (NEP-80) utilized for the Category V and VI portions of the 1980 Survey. These additional data items include the estimated number and capacity of wet-weather treatment plants, and storage basins required to meet the selected water quality objectives. A brief discussion on the conduct of the Category V and VI portions of the 1980 Survey is presented in Appendix B. The discussion includes the basis for developing Category V and VI cost estimates.

The technical tables which follow are structured such that a discussion of each table is presented immediately before the table. The reader should also consult Appendices B and D for information related to the conduct of the survey, and the combined sewer data collection worksheet, respectively.

Basis of Estimate	Total	Corrective Action Not known	Seal Sewer Lines	Replace or Recline Sewer Sections	Change of Create Flow Routing System	Provide Flow Equalization	Other
STATE CERTIFICATION	0	0	0	0	0	0	0
I/I ANALYSIS COMPLETED	1,044,470	21,317	548,696	441,196	651	6,181	26,429
EVALUATION SURVEY COMPLETED	285,846	5,266	57,123	213,225	38	828	9,366
ENGINEER/CONSULTANT FIRM ESTIMATE	15,683	35	9,921	5,631	0	0	96
COST OF PREVIOUS COMPARABLE CONSTRUCTION	0	0	0	0	0	0	0
ENGINEER/CONSULTANT PRELIMINARY ESTIMATE	483,534	17,451	159,117	240,320	609	12,649	53,388
EPA - SUPPLIED COST ESTIMATING PROCEDURES	338,496	137,168	124,438	69,001	119	0	7,770
COST EFFECTIVE ANALYSIS	32,035	7,076	9,514	12,683	0	27	2,735
(NO BASIS GIVEN)	0	0	0	0	0	0	0
TOTALS	2,200,064	188,313	908,809	982,056	1,417	19,685	99,784
STATE CERTIFICATION	0	0	0	0	0	0	0
I/I ANALYSIS COMPLETED	66	0	2	47	1	0	16
EVALUATION SURVEY COMPLETED	40	0	0	27	0	0	13
ENGINEER/CONSULTANT FIRM ESTIMATE	13	0	0	9	0	0	4
COST OF PREVIOUS COMPARABLE CONSTRUCTION	0	0	0	0	0	0	0
ENGINEER/CONSULTANT PRELIMINARY ESTIMATE	273	0	5	208	12	0	48
EPA - SUPPLIED COST ESTIMATING PROCEDURES	0	0	0	0	0	0	0
COST EFFECTIVE ANALYSIS	49	0	3	36	2	0	8
(NO BASIS GIVEN)	0	0	0	0	0	0	0
TOTALS	441	0	10	327	15	0	89
STATE CERTIFICATION	0	0	0	0	0	0	0
I/I ANALYSIS COMPLETED	45,682	0	3,830	34,200	94	0	7,558
EVALUATION SURVEY COMPLETED	968,135	0	0	949,434	0	0	18,701
ENGINEER/CONSULTANT FIRM ESTIMATE	9,678	0	0	4,682	0	0	4,996
COST OF PREVIOUS COMPARABLE CONSTRUCTION	0	0	0	0	0	0	0
ENGINEER/CONSULTANT PRELIMINARY ESTIMATE	4,718,693	0	7,346	4,603,363	10,388	0	97,596
EPA - SUPPLIED COST ESTIMATING PROCEDURES	0	0	0	0	0	0	0
COST EFFECTIVE ANALYSIS	227,216	0	655	204,450	144	0	21,967
(NO BASIS GIVEN)	0	0	0	0	0	0	0
TOTALS	5,969,404	0	11,831	5,796,129	10,626	0	150,818

Table 54

Summary of Existing Combined Sewer Systems

(Length in Meters, Area in Hectares)

Table 54 lists the total number of combined sewer systems identified for each state by the 1980 Survey. Each system identified corresponds to a worksheet in the National Combined Sewer System Data File. The work-sheet is described in Appendix D, and conduct of the Categories V and VI portion of the Needs Survey is described in Appendix B. Totals by state, for each of the following items are contained in Table 54:

Number of Combined Sewer Systems: The number of combined sewer systems in each state corresponds to the number of worksheets entered on the combined sewer system data file for that state. A separate worksheet was completed for each combined sewer system/major receiving water configuration.

Combined Sewer Area: The area, in hectares, drained directly by the combined sewer system which is tributary to the subject receiving water.

Population Served: The total number of people resident to the area drained directly by the combined sewer system.

Combined Sewer Length: The total length of combined sewer, in meters, tributary to the subject receiving water.

Number of CSO Points: The number of points at which the combined wastewater/stormwater is discharged from the collection system directly into the receiving water during periods of high flow.

STATE	# OF SYSTEMS	COMBINED SEWER AREA	POPULATION SERVED	COMBINED SEWER LENGTH	CSO POINTS
ALABAMA	0	0	0	0	0
ALASKA	2	131	4,600	1,189	0
ARIZONA	0	0	0	0	0
ARKANSAS	0	0	0	0	0
CALIFORNIA	5	15,430	652,119	1,840,031	44
COLORADO	5	7,147	152,341	94,308	3
CONNECTICUT	14	7,020	415,217	954,591	242
DELAWARE	4	3,423	90,006	320,470	53
DISTRICT OF COLUMBIA	1	5,959	469,093	1,068,696	59
FLORIDA	1	255	4,370	29,195	10
GEORGIA	4	11,635	473,018	710,021	31
GUAM	0	0	0	0	0
HAWAII	0	0	0	0	0
IDAHO	14	3,709	46,012	323,429	24
ILLINOIS	117	149,524	5,651,169	16,056,778	1,142
INDIANA	131	134,554	2,808,961	8,396,604	1,053
IOWA	19	9,197	404,264	686,410	82
KANSAS	3	11,542	464,000	554,002	17
KENTUCKY	17	20,342	768,556	1,097,522	108
LOUISIANA	0	0	0	0	0
MAINE	61	22,729	390,775	1,674,122	293
MARYLAND	11	2,376	53,666	240,916	60
MASSACHUSETTS	34	25,216	1,665,156	2,859,883	368
MICHIGAN	36	106,525	2,014,925	12,403,816	624
MINNESOTA	17	11,635	251,655	2,553,382	105
MISSISSIPPI	0	0	0	0	0
MISSOURI	14	35,993	674,301	3,412,709	91
MONTANA	16	3,521	130,416	381,858	0
NEBRASKA	3	10,315	199,405	883,605	23
NEVADA	0	0	0	0	0
NEW HAMPSHIRE	22	5,639	283,156	674,869	164
NEW JERSEY	30	40,379	2,268,782	2,732,247	297
NEW MEXICO	0	0	0	0	0
NEW YORK	74	113,016	9,595,263	11,571,742	1,088
NORTH CAROLINA	1	121	6,000	34,708	0
NORTH DAKOTA	3	495	34,249	68,636	8
OHIO	119	136,157	3,133,923	10,286,934	1,783
OKLAHOMA	0	0	0	0	0
OREGON	11	6,050	397,001	2,231,270	114
PENNSYLVANIA	113	42,403	4,175,996	8,808,092	1,959
PUERTO RICO	1	432	600,000	80,520	0
RHODE ISLAND	2	4,605	190,550	431,575	87
SAMOA	0	0	0	0	0
SOUTH CAROLINA	0	0	0	0	0
SOUTH DAKOTA	10	2,476	90,991	268,720	1
TENNESSEE	3	6,215	150,500	685,833	49
TEXAS	1	1,591	35,000	40,931	0
TRUST TERRITORIES	0	0	0	0	0
UTAH	1	103	3,618	11,179	0
VERMONT	31	5,406	128,312	457,661	158
VIRGIN ISLANDS	0	0	0	0	0
VIRGINIA	12	10,250	537,350	1,269,233	186
WASHINGTON	34	34,676	706,621	3,331,650	271
WEST VIRGINIA	47	23,863	435,050	2,271,838	553
WISCONSIN	13	12,144	627,347	1,612,987	344
WYOMING	1	395	14,645	42,881	0
U.S. TOTALS	1,116	1,106,060	42,421,542	103,457,040	11,494

Receiving Water Types for Combined Sewer Overflow

(Area in Hectares)

Table 55 identifies the type of major receiving water body into which the combined sewer system discharges when overflow occurs. For the purposes of this table, a stream includes all channels with a mean annual depth less than 10 feet. This includes classification codes 1, 2, and 3 from item No. 20 of the worksheet. A river includes all channels with a mean annual depth greater than or equal to 10 feet. This includes classification codes 4, 5, and 6 from item No. 20 of the worksheet. Lakes include classification codes 7 and 8 of the worksheet, while estuaries include codes 9 through 14 of the worksheet. Each of these classification codes are defined in Appendix D of this report.

It should be noted that not all major receiving waters have been identified on the 1980 data file. Therefore, of the 1,118 systems on the 1980 data file, 918 (approximately 82%) are identified as to major receiving water type. Table 55 contains the following items.

Number of Combined Sewer Systems: Same as Table 54.

Combined Sewer Area: Same as Table 54.

Number of Systems Discharging to Streams: The total number of combined sewer systems, by state, known to discharge into streams. The definition of a stream is presented above.

Total Combined Sewer Area Discharging to Streams: The total area, in hectares, of combined sewer systems, by state, known to discharge into streams.

Number of Systems Discharging to Rivers: The total number of combined sewer systems, by state, known to discharge into rivers.

Total Combined Sewer Area Discharging to Rivers: The total area, in hectares, of combined sewer systems, by state, known to discharge into rivers.

Number of Systems Discharging to Lakes: The total number of combined sewer systems, by state, known to discharge into lakes.

Total Combined Sewer Area Discharging to Lakes: The total area, in hectares, of combined sewer systems, by state, known to discharge into lakes.

Number of Systems Discharging to Estuaries: The total number of combined sewer systems, by state, known to discharge into estuaries.

Total Combined Sewer Area Discharging to Estuaries: The total area, in hectares, of combined sewer systems, by state, known to discharge into estuaries.

Number of Systems Discharging to Oceans: The total number of combined sewer systems, by State, known to discharge into oceans.

Total Combined Sewer Area Discharging to an Ocean: The total area, in hectares, of combined sewer systems, by State, known to discharge into oceans.

STATE	# OF SYSTEMS	TOTAL CS AREA	STREAM DISCHARGE #	STREAM DISCHARGE AREA	RIVER DISCHARGE #	RIVER DISCHARGE AREA	LAKE DISCHARGE #	LAKE DISCHARGE AREA	ESTUARY DISCHARGE #	ESTUARY DISCHARGE AREA	OCEAN DISCHARGE #	OCEAN DISCHARGE AREA
ALABAMA	0	0	0	0	0	0	0	0	0	0	0	0
ALASKA	2	131	0	0	0	0	0	0	0	0	1	130
ARIZONA	0	0	0	0	0	0	0	0	0	0	0	0
ARKANSAS	0	0	0	0	0	0	0	0	0	0	0	0
CALIFORNIA	5	15,430	1	668	1	2,754	1	445	1	7,350	1	4,213
COLORADO	3	7,147	1	479	1	6,480	0	0	0	0	0	0
CONNECTICUT	14	7,020	6	2,007	4	1,907	0	0	4	3,107	0	0
DELAWARE	5	3,423	3	249	1	2,809	0	0	0	0	0	0
DISTRICT OF COLUMBIA	1	5,959	0	0	0	0	0	0	1	5,959	0	0
FLORIDA	1	255	0	0	0	0	1	255	0	0	0	0
GEORGIA	8	11,036	2	4,572	6	7,004	0	0	0	0	0	0
GUAM	0	0	0	0	0	0	0	0	0	0	0	0
HAWAII	0	0	0	0	0	0	0	0	0	0	0	0
IDAHO	14	3,759	3	230	9	3,414	1	12	0	0	0	0
ILLINOIS	117	144,024	53	52,241	23	80,617	2	400	0	0	0	0
INDIANA	131	134,554	88	52,355	16	51,676	5	8,327	0	0	0	0
IOWA	19	9,107	10	3,167	9	5,941	0	0	0	0	0	0
KANSAS	3	11,542	0	0	3	11,542	0	0	0	0	0	0
KENTUCKY	17	20,342	0	0	15	19,900	0	0	0	0	0	0
LOUISIANA	0	0	0	0	0	0	0	0	0	0	0	0
MAINE	51	22,124	18	1,970	27	13,304	0	0	8	2,058	8	4,738
MARYLAND	11	2,376	5	1,730	1	557	0	0	1	8	0	0
MASSACHUSETTS	34	25,216	13	8,505	6	6,714	0	0	11	7,109	1	94
MICHIGAN	95	134,526	57	57,507	11	45,310	8	3,576	0	0	0	0
MINNESOTA	17	11,035	3	683	4	10,430	0	0	0	0	0	0
MISSISSIPPI	0	0	0	0	0	0	0	0	0	0	0	0
MISSOURI	14	35,565	7	12,505	6	23,061	0	0	0	0	0	0
MONTANA	15	3,921	5	1,265	5	2,179	0	0	0	0	0	0
NEBRASKA	3	10,316	1	2,233	2	8,113	0	0	0	0	0	0
NEVADA	0	0	0	0	0	0	0	0	0	0	0	0
NEW HAMPSHIRE	22	5,331	9	1,400	10	4,074	1	1	0	0	0	0
NEW JERSEY	30	40,374	9	8,057	0	0	0	0	10	22,253	0	0
NEW MEXICO	0	0	0	0	0	0	0	0	0	0	0	0
NEW YORK	74	113,910	17	15,291	34	40,497	2	9,157	14	48,071	0	0
NORTH CAROLINA	1	121	0	0	1	121	0	0	0	0	0	0
NORTH DAKOTA	5	495	2	26	2	437	0	0	0	0	0	0
OHIO	119	135,157	53	44,494	19	40,904	9	24,480	0	0	0	0
OKLAHOMA	0	0	0	0	0	0	0	0	0	0	0	0
OREGON	11	8,930	5	185	6	7,805	0	0	0	0	0	0
PENNSYLVANIA	113	92,493	75	39,003	19	23,980	2	6,029	2	19,243	0	0
PUERTO RICO	1	432	1	432	0	0	0	0	0	0	0	0
RHODE ISLAND	2	4,505	0	0	2	4,505	0	0	0	0	0	0
SAMOA	0	0	0	0	0	0	0	0	0	0	0	0
SOUTH CAROLINA	0	0	0	0	0	0	0	0	0	0	0	0
SOUTH DAKOTA	13	2,976	8	167	1	2,190	0	0	0	0	0	0
TENNESSEE	3	8,216	0	0	3	3,210	0	0	0	0	0	0
TEXAS	1	1,091	0	0	0	0	0	0	0	0	0	0
TRUST TERRITORIES	0	0	0	0	0	0	0	0	0	0	0	0
UTAH	1	103	1	103	0	0	0	0	0	0	0	0
VERMONT	31	6,490	12	2,377	12	2,954	4	784	0	0	0	0
VIRGIN ISLANDS	0	0	0	0	0	0	0	0	0	0	0	0
VIRGINIA	12	10,206	3	359	5	4,845	0	0	3	4,602	0	0
WASHINGTON	34	34,376	5	2,182	10	12,514	1	153	5	13,804	4	1,510
WEST VIRGINIA	57	23,483	23	11,730	15	11,753	0	0	0	0	0	0
WISCONSIN	13	12,144	4	1,859	1	413	8	9,889	0	0	0	0
WYOMING	1	395	1	395	0	0	0	0	0	0	0	0
U.S. TOTALS	1,118	1,105,936	587	327,294	293	477,803	43	63,290	80	134,303	15	10,691

77<

Table 56

Summary of Present and Projected Urbanized Area Characteristics

(Area in Hectares)

Table 56 provides drainage area and population data for both combined and separately sewered Urbanized Areas in the U.S. The specific criteria for defining Urbanized Areas are given in Appendix B. Since the use of combined sewers is no longer considered accepted engineering practice, it was assumed that present and projected combined sewer system characteristics would be the same and that all future growth would occur in separately sewered areas. The following items are contained in Table 56:

Number of Urbanized Areas: The total number of Urbanized Areas as defined in Appendix B, listed by State.

Combined Sewer Area in Urbanized Areas: The combined sewer area, in hectares, located within Urbanized Areas, listed by State.

Combined Sewer Population in Urbanized Areas: The total population residing within the combined sewer area in Urbanized Areas, listed by State.

Stormwater Runoff Area (1970): The Urbanized Area, in hectares, which contributes stormwater runoff based on 1970 census data, listed by State.

Stormwater Runoff Population (1970): The estimated 1970 population, based on census data, which resides within the stormwater runoff area for Urbanized Areas, listed by State.

Stormwater Runoff Area (2000): The Urbanized Area, in hectares, which contributes stormwater runoff based on projected year 2000 population estimates listed by State.

Stormwater Runoff Population (2000): The projected year 2000 population for the stormwater runoff area for Urbanized Areas, listed by State.

STATE	# OF UA S	COMBINED SEWER AREA	COMBINED SEWER POPULATION	STORMWATER RUNOFF (1970) AREA	STORMWATER RUNOFF (1970) POPULATION	STORMWATER RUNOFF (2000) AREA	STORMWATER RUNOFF (2000) POPULATION
ALABAMA	9	0	0	198,081	1,402,102	244,859	1,702,400
ALASKA	1	0	0	14,126	110,702	50,978	399,781
ARIZONA	2	0	0	127,578	1,157,541	322,597	2,904,408
ARKANSAS	4	0	0	46,786	378,624	84,967	692,603
CALIFORNIA	18	14,317	827,120	1,019,762	15,453,993	1,408,742	21,144,279
COLORADO	4	6,480	96,800	104,561	1,327,211	204,909	2,559,825
CONNECTICUT	12	6,221	294,050	217,132	1,946,729	240,587	2,126,455
DELAWARE	1	2,809	80,370	22,359	269,304	38,011	457,823
DISTRICT OF COLUMBIA	1	5,959	489,093	9,956	267,417	26,058	699,898
FLORIDA	15	0	0	482,268	4,731,073	1,047,544	10,774,658
GEORGIA	7	11,491	394,810	177,829	1,485,350	295,575	2,449,033
GUAM	0	0	0	0	0	0	0
HAWAII	1	0	0	29,808	442,397	56,681	841,227
IDAHO	1	0	0	7,620	85,187	15,599	174,382
ILLINOIS	13	111,307	4,998,930	298,204	2,970,850	407,855	4,077,296
INDIANA	10	82,913	1,695,820	182,430	699,313	330,264	1,112,244
IOWA	7	1,536	160,000	111,890	682,155	138,081	841,622
KANSAS	4	11,380	459,000	52,123	326,933	304,382	557,243
KENTUCKY	6	14,083	504,160	69,976	630,329	139,237	1,056,425
LOUISIANA	7	0	0	103,291	1,780,735	131,642	2,323,091
MAINE	2	5,742	136,500	26,295	35,311	62,694	93,015
MARYLAND	2	0	0	144,530	2,588,919	198,109	3,470,905
MASSACHUSETTS	11	19,993	1,567,100	332,286	2,767,096	396,891	3,302,095
MICHIGAN	13	91,353	2,251,900	301,595	3,484,865	356,665	4,161,881
MINNESOTA	6	9,259	208,910	207,847	1,744,983	262,114	2,190,708
MISSISSIPPI	3	0	0	36,055	320,592	48,402	446,145
MISSOURI	5	34,947	780,620	196,629	1,797,221	257,508	2,190,148
MONTANA	2	0	0	12,623	142,102	16,824	187,870
NEBRASKA	3	10,206	191,510	32,795	396,782	50,995	621,919
NEVADA	2	0	0	41,135	330,368	96,192	791,692
NEW HAMPSHIRE	3	2,597	138,800	19,435	35,143	161,263	195,685
NEW JERSEY	7	38,710	2,063,605	562,867	4,014,767	823,732	5,665,879
NEW MEXICO	1	0	0	29,652	297,451	49,964	501,205
NEW YORK	9	97,249	8,760,867	211,614	5,683,625	220,819	8,133,133
NORTH CAROLINA	11	0	0	162,907	1,367,048	198,900	1,690,861
NORTH DAKOTA	1	93	2,300	3,873	51,128	5,277	69,658
OHIO	17	84,050	2,416,560	492,695	4,233,003	578,678	4,959,925
OKLAHOMA	4	0	0	146,681	1,049,072	209,548	1,477,807
OREGON	3	7,501	385,540	77,595	598,512	162,760	1,222,103
PENNSYLVANIA	14	63,812	3,273,776	426,931	3,712,003	434,788	3,861,641
PUERTO RICO	4	432	16,000	36,452	1,068,077	45,558	1,313,987
RHODE ISLAND	2	4,805	190,550	50,301	554,688	47,513	523,520
SAMOA	0	0	0	0	0	0	0
SOUTH CAROLINA	5	0	0	84,266	723,074	104,132	903,647
SOUTH DAKOTA	2	2,160	47,700	4,994	28,306	10,391	58,086
TENNESSEE	6	5,551	116,500	202,223	1,519,119	275,565	2,049,263
TEXAS	28	1,891	35,000	806,813	6,955,930	1,775,360	14,485,772
TRUST TERRITORIES	0	0	0	0	0	0	0
UTAH	3	0	0	80,430	733,179	96,392	857,675
VERMONT	0	0	0	0	0	0	0
VIRGIN ISLANDS	0	0	0	0	0	0	0
VIRGINIA	8	8,527	410,100	229,989	1,990,982	398,835	2,920,916
WASHINGTON	6	29,495	629,024	158,996	1,380,369	241,715	2,870,142
WEST VIRGINIA	5	8,601	230,260	29,113	168,175	32,784	208,993
WISCONSIN	9	9,669	444,080	187,119	1,621,765	205,972	2,327,167
WYOMING	0	0	0	0	0	0	0
U.A. TOTALS	320	805,140	34,298,155	6,612,711	87,547,752	13,374,903	129,848,136

Receiving Water Types for Urban Stormwater Runoff Present Conditions (1970)

(Areas in Hectares)

Table 57 identifies the type of major receiving water into which urban stormwater is discharged, for the 1970 Urbanized Area data presented in Table 56. The specific criteria for defining an Urbanized Area are given in Appendix B. For the purposes of this table, a stream includes all channels with a mean annual depth less than 10 feet, and a river includes all channels with a mean annual depth greater than or equal to 10 feet. The following items are contained in Table 57:

Number of Urbanized Areas: The total number of Urbanized Aeas as defined in Appendix B, listed by State. This item is the same as presented in Table 56.

Stormwater Runoff Area (1970): The Urbanized Area, in hectares, which contributes stormwater runoff based on 1970 census data. This item is the same as presented in Table 56.

Stormwater Runoff Area Discharging to Streams: The total 1970 stormwater drainage area, in hectares, known to discharge into streams as defined above.

Stormwater Runoff Area Discharging to Rivers: The total 1970 stormwater drainage area, in hectares, known to discharge into rivers as defined above.

Stormwater Runoff Area Discharging to Lakes: The total 1970 stormwater drainage area, in hectares, known to discharged into lakes.

Stormwater Runoff Area Discharging to Estuaries: The total 1970 stormwater drainage area, in hectares, known to discharge into estuaries.

Stormwater Runoff Area Discharging to Oceans: The total 1970 stormwater drainage area, in hectares, known to discharge into oceans.

STATE	# OF UA S	STORMWATER TOTAL AREA	STREAM DISCHARGE	RIVER DISCHARGE	LAKE DISCHARGE	ESTUARY DISCHARGE	OCEAN DISCHARGE
ALABAMA	9	198,081	99,818	54,613	0	43,649	0
ALASKA	1	14,126	0	0	0	14,126	0
ARIZONA	2	127,578	127,578	0	0	0	0
ARKANSAS	4	46,786	1,763	45,023	0	0	0
CALIFORNIA	18	1,019,762	219,802	69,433	0	170,733	559,794
COLORADO	4	104,561	104,561	0	0	0	0
CONNECTICUT	12	217,132	49,436	57,657	0	72,839	37,200
DELAWARE	1	22,359	0	0	0	22,359	0
DISTRICT OF COLUMBIA	1	9,956	0	0	0	9,956	0
FLORIDA	15	482,268	7,517	7,724	41,213	358,759	67,055
GEORGIA	7	177,829	0	161,269	0	16,560	0
GUAM	0	0	0	0	0	0	0
HAWAII	1	29,808	0	0	0	0	29,808
IDAHO	1	7,620	7,620	0	0	0	0
ILLINOIS	13	298,204	37,998	260,205	0	0	0
INDIANA	10	182,430	49,063	133,367	0	0	0
IOWA	7	111,890	61,206	50,683	0	0	0
KANSAS	4	52,123	0	52,123	0	0	0
KENTUCKY	6	69,976	10,342	59,634	0	0	0
LOUISIANA	7	103,291	0	103,291	0	0	0
MAINE	2	26,295	0	15,777	0	0	10,518
MARYLAND	2	144,530	0	0	0	144,530	0
MASSACHUSETTS	11	332,286	60,688	79,858	0	191,740	0
MICHIGAN	13	301,595	133,486	148,928	19,181	0	0
MINNESOTA	6	207,847	3,940	185,478	18,429	0	0
MISSISSIPPI	3	36,055	0	19,544	0	0	16,511
MISSOURI	5	196,829	27,242	169,587	0	0	0
MONTANA	2	12,623	0	12,623	0	0	0
NEBRASKA	3	32,795	13,504	19,291	0	0	0
NEVADA	2	41,135	41,135	0	0	0	0
NEW HAMPSHIRE	3	19,435	0	19,435	0	0	0
NEW JERSEY	7	562,847	36,128	1,768	0	507,558	17,392
NEW MEXICO	1	29,652	29,652	0	0	0	0
NEW YORK	9	211,614	44,433	98,781	15,410	52,989	0
NORTH CAROLINA	11	162,907	126,412	28,901	0	7,595	0
NORTH DAKOTA	1	3,873	0	3,873	0	0	0
OHIO	17	492,695	224,476	120,329	147,891	0	0
OKLAHOMA	4	146,681	99,300	47,382	0	0	0
OREGON	3	77,595	0	77,595	0	0	0
PENNSYLVANIA	14	426,931	63,171	195,264	0	168,496	0
PUERTO RICO	4	36,452	6,610	0	0	26,136	3,707
RHODE ISLAND	2	50,301	0	0	0	50,301	0
SAMOA	0	0	0	0	0	0	0
SOUTH CAROLINA	5	84,266	27,734	30,819	0	25,713	0
SOUTH DAKOTA	2	9,994	0	9,994	0	0	0
TENNESSEE	6	202,223	0	202,223	0	0	0
TEXAS	28	806,813	317,157	409,692	18,922	33,774	27,268
TRUST TERRITORIES	0	0	0	0	0	0	0
UTAH	3	80,430	0	0	80,430	0	0
VERMONT	0	0	0	0	0	0	0
VIRGIN ISLANDS	0	0	0	0	0	0	0
VIRGINIA	8	229,989	17,211	50,265	0	162,514	0
WASHINGTON	6	158,996	5,754	29,953	0	123,288	0
WEST VIRGINIA	5	29,113	0	29,113	0	0	0
WISCONSIN	9	187,115	0	116,621	70,495	0	0
WYOMING	0	0	0	0	0	0	0
U.A. TOTALS	320	8,612,711	2,054,736	3,173,137	411,970	2,203,614	769,253

Table 58

Receiving Water Types for Urban Stormwater Runoff—Year 2000 Conditions

(Area in Hectares)

Table 58 identifies the type of major receiving water body into which urban stormwater is discharged, for the projected year 2000 Urbanized Area presented in Table 56. The specific criteria for defining an Urbanized Area are given in Appendix B. For the purposes of this table, a stream includes all channels with a mean annual depth less than 10 feet, and a river includes all channels with a mean annual depth greater than or equal to 10 feet. The following items are contained in Table 58.

Number of Urbanized Areas: The total number of Urbanized Areas as defined in Appendix B, listed by State. This item is the same as presented in Table 56.

Stormwater Runoff Area (2000): The Urbanized Area, in hectares, which contributes stormwater runoff directly to a major receiving water, based on projected year 2000 projection estimates. This item is the same as presented in Table 56.

Stormwater Runoff Area Discharging to Streams: The total projected year 2000 stormwater drainage area, in hectares, known to discharge into streams as defined above.

Stormwater Runoff Area Discharging to Rivers: The total projected year 2000 stormwater drainage area, in hectares, known to discharge into rivers as defined above.

Stormwater Runoff Area Discharging to Lakes: The total projected year 2000 stormwater drainage area, in hectares, known to discharge into lakes.

Stormwater Runoff Area Discharging to Estuaries: The total projected year 2000 stormwater drainage area, in hectares, known to discharge into estuaries.

Stormwater Runoff Area Discharging to Oceans: The total projected year 2000 stormwater drainage area, in hectares, known to discharge into oceans.

STATE	# OF UA S	STORMWATER TOTAL AREA	STREAM DISCHARGE	RIVER DISCHARGE	LAKE DISCHARGE	ESTUARY DISCHARGE	OCEAN DISCHARGE
ALABAMA	9	244,859	124,026	67,904	0	52,929	0
ALASKA	1	50,978	0	0	0	50,978	0
ARIZONA	2	322,597	322,597	0	0	0	0
ARKANSAS	4	84,967	2,525	82,443	0	0	0
CALIFORNIA	18	1,408,742	320,962	96,765	0	243,400	747,616
COLORADO	4	204,909	204,909	0	0	0	0
CONNECTICUT	12	240,587	38,723	61,346	0	92,108	48,410
DELAWARE	1	38,011	0	0	0	38,011	0
DISTRICT OF COLUMBIA	1	26,058	0	0	0	26,058	0
FLORIDA	15	1,047,544	15,848	16,387	82,542	756,384	176,384
GEORGIA	7	295,575	0	277,390	0	18,185	0
GUAM	0	0	0	0	0	0	0
HAWAII	1	56,681	0	0	0	0	56,681
IDAHO	1	15,599	15,599	0	0	0	0
ILLINOIS	13	407,855	48,072	359,783	0	0	0
INDIANA	10	330,264	137,188	193,076	0	0	0
IOWA	7	138,061	79,469	58,593	0	0	0
KANSAS	4	304,382	0	304,382	0	0	0
KENTUCKY	6	139,237	11,627	127,611	0	0	0
LOUISIANA	7	131,042	0	131,042	0	0	0
MAINE	2	62,694	0	29,963	0	0	32,732
MARYLAND	2	198,109	0	0	0	198,109	0
MASSACHUSETTS	11	396,891	79,318	89,178	0	228,394	0
MICHIGAN	13	356,665	161,229	176,303	19,133	0	0
MINNESOTA	6	262,114	516	245,681	15,916	0	0
MISSISSIPPI	3	48,402	0	31,862	0	0	16,541
MISSOURI	5	257,508	41,321	216,187	0	0	0
MONTANA	2	16,824	0	16,824	0	0	0
NEBRASKA	3	50,995	19,112	31,882	0	0	0
NEVADA	2	96,192	96,192	0	0	0	0
NEW HAMPSHIRE	3	161,263	0	161,263	0	0	0
NEW JERSEY	7	823,732	48,809	1,695	0	754,634	18,594
NEW MEXICO	1	49,904	49,904	0	0	0	0
NEW YORK	9	220,819	52,940	66,746	21,224	79,909	0
NORTH CAROLINA	11	198,900	149,395	38,977	0	10,528	0
NORTH DAKOTA	1	5,277	0	5,277	0	0	0
OHIO	17	578,078	262,910	150,066	165,102	0	0
OKLAHOMA	4	209,548	151,928	57,620	0	0	0
OREGON	3	162,760	0	162,760	0	0	0
PENNSYLVANIA	14	434,788	49,026	172,622	0	213,140	0
PUERTO RICO	4	45,550	10,709	0	0	28,782	6,058
RHODE ISLAND	2	47,513	0	0	0	47,513	0
SAMOA	0	0	0	0	0	0	0
SOUTH CAROLINA	5	104,132	26,284	49,522	0	28,326	0
SOUTH DAKOTA	2	10,391	0	10,391	0	0	0
TENNESSEE	6	275,565	0	275,565	0	0	0
TEXAS	28	1,775,360	865,197	781,624	28,557	48,348	51,634
TRUST TERRITORIES	0	0	0	0	0	0	0
UTAH	3	96,392	0	0	96,392	0	0
VERMONT	0	0	0	0	0	0	0
VIRGIN ISLANDS	0	0	0	0	0	0	0
VIRGINIA	8	398,835	23,609	169,746	0	205,479	0
WASHINGTON	8	241,715	6,151	51,648	0	183,917	0
WEST VIRGINIA	5	32,784	0	32,784	0	0	0
WISCONSIN	9	265,972	0	157,733	108,238	0	0
WYOMING	0	0	0	0	0	0	0
U.A. TOTALS	328	13,374,903	3,416,177	4,961,840	537,105	3,305,132	1,154,651

Table 59

Selected Facilities for CSO Control in Urbanized Areas

(Area in Hectares, Flow in 1000 m³/Day, Volume in 1000 m³)

Table 59 presents information which was developed as part of the cost estimating procedure for Categories V and VI of the 1980 Needs Survey. This CSO control data was developed only for Urbanized Areas as presented in Table 56. The storage and treatment requirements presented in Table 59 were estimated using the 1980 Needs Estimation Program (NEP-80) for the fish and wildlife, and recreation water quality objectives. The fish and wildlife objective was based on eliminating low dissolved oxygen events (less than 2.0 mg/l) and ensuring that SS concentrations in CSO would be less than or equal to background SS concentrations in the receiving water. The recreation objective was based on scaling up the facilities required to meet the fish and wildlife objective such that a 95 percent removal of fecal coliform organisms would be obtained. A brief description of the basis for Category V and VI cost estimates is presented in Appendix B. The following items are contained in Table 59:

Number of Urbanized Areas: The total number of Urbanized Areas as defined in Appendix B, listed by State. This item is the same as presented in Table 56.

Combined Sewer Area in Urbanized Areas: The combined sewer area, in hectares, located within Urbanized Areas, listed by State. This item is the same as presented in Table 56.

Number of CSO Treatment Plants: The total estimated number of CSO treatment plants required to meet the fish and wildlife water quality objective in Urbanized Areas, listed by State.

Number of CSO Storage Basins: The total estimated number of CSO storage basins required to meet the fish and wildlife water quality objective in Urbanized Areas, listed by State.

Total CSO Treatment Capacity for Fish and Wildlife: The total estimated CSO treatment capacity, in 1000 m³/day, required to meet the fish and wildlife water quality objective in Urbanized Areas, listed by State.

Average CSO Unit Treatment Capacity for Fish and Wildlife: The estimated average CSO unit treatment capacity, in 1000 m³/day/hectare, required to meet the fish and wildlife water quality objective in Urbanized Areas, listed by State.

Total CSO Treatment Capacity for Recreation: The total estimated CSO treatment capacity, in 1000 m³/day, required to meet the recreation water quality objective in Urbanized Areas, listed by State.

Average CSO Unit Treatment Capacity for Recreation: The estimated average CSO unit treatment capacity, in 1000 m³/day/hectare, required to meet the recreation water quality objective in Urbanized Areas, listed by State.

Total CSO Storage Capacity for Fish and Wildlife: The total estimated CSO storage capacity, in 1000 m³, required to meet the fish and wildlife water quality objective in Urbanized Areas, listed by State.

Average CSO Unit Storage Capacity for Fish and Wildlife: The estimated average CSO unit storage capacity, in 1000 m³/hectare, required to meet the fish and wildlife water quality objective in Urbanized Areas, listed by State.

Total CSO Storage Capacity for Recreation:
The total estimated CSO storage capacity, in 1000 m³, required to meet the recreation water quality objective in Urbanized Areas, listed by State.

Average CSO Unit Storage Capacity for Recreation: The estimated average CSO unit storage capacity, in 1000 m³/hectare, required to meet the recreation water quality objective in Urbanized Areas, listed by State.

STATE	# OF UA'S	TOTAL CSO AREA	PLANTS	BASINS	FISH & WILDLIFE TREATMENT TOTAL	UNIT	FISH & WILDLIFE STORAGE TOTAL	UNIT	RECREATION TREATMENT TOTAL	UNIT	RECREATION STORAGE TOTAL	UNIT
ALABAMA	9	0	0	0	0.00	0.0000	0.00	0.0000	0.00	0.0000	0.00	0.0000
ALASKA	1	0	0	0	0.00	0.0000	0.00	0.0000	0.00	0.0000	0.00	0.0000
ARIZONA	2	0	0	0	0.00	0.0000	0.00	0.0000	0.00	0.0000	0.00	0.0000
ARKANSAS	4	0	0	0	0.00	0.0000	0.00	0.0000	0.00	0.0000	0.00	0.0000
CALIFORNIA	18	14,317	6	10	838.55	0.0237	1,219.32	0.0345	1,608.67	0.0455	1,287.93	0.0364
COLORADO	4	6,480	3	5	39.47	0.0025	516.28	0.0323	39.47	0.0025	782.64	0.0489
CONNECTICUT	12	8,221	10	18	408.51	0.0266	809.01	0.0527	839.95	0.0547	2,125.64	0.1384
DELAWARE	1	2,809	2	4	188.23	0.0271	300.07	0.0433	427.79	0.0617	850.33	0.1226
DISTRICT OF COLUMBIA	1	5,959	3	5	399.28	0.0271	576.05	0.0392	1,125.23	0.0765	1,661.63	0.1129
FLORIDA	15	0	0	0	0.00	0.0000	0.00	0.0000	0.00	0.0000	0.00	0.0000
GEORGIA	7	11,491	9	15	569.88	0.0201	1,434.20	0.0505	905.86	0.0319	2,592.75	0.0914
GUAM	0	0	0	0	0.00	0.0000	0.00	0.0000	0.00	0.0000	0.00	0.0000
HAWAII	1	0	0	0	0.00	0.0000	0.00	0.0000	0.00	0.0000	0.00	0.0000
IDAHO	1	0	0	0	0.00	0.0000	0.00	0.0000	0.00	0.0000	0.00	0.0000
ILLINOIS	13	111,307	22	38	5,093.35	0.0185	7,339.03	0.0267	6,350.21	0.0231	9,656.94	0.0351
INDIANA	10	42,913	29	48	2,225.79	0.0109	7,135.55	0.0349	2,477.06	0.0121	10,182.00	0.0497
IOWA	7	1,535	2	4	93.58	0.0247	113.06	0.0298	105.40	0.0278	124.44	0.0328
KANSAS	4	11,380	8	10	443.08	0.0158	617.27	0.0241	623.92	0.0222	996.23	0.0355
KENTUCKY	6	14,083	6	10	866.17	0.0250	1,526.86	0.0439	1,910.23	0.0552	4,609.72	0.1326
LOUISIANA	7	0	0	0	0.00	0.0000	0.00	0.0000	0.00	0.0000	0.00	0.0000
MAINE	2	5,742	5	9	313.13	0.0221	497.89	0.0351	874.45	0.0617	1,736.17	0.1226
MARYLAND	2	0	0	0	0.00	0.0000	0.00	0.0000	0.00	0.0000	0.00	0.0000
MASSACHUSETTS	11	19,993	14	24	1,706.19	0.0346	2,265.95	0.0459	3,738.61	0.0757	5,681.36	0.1151
MICHIGAN	13	41,353	15	28	3,202.65	0.0145	6,114.28	0.0271	4,828.74	0.0214	8,219.56	0.0364
MINNESOTA	6	9,259	5	9	394.81	0.0173	742.40	0.0325	394.81	0.0173	871.81	0.0381
MISSISSIPPI	3	0	0	0	0.00	0.0000	0.00	0.0000	0.00	0.0000	0.00	0.0000
MISSOURI	5	34,947	10	17	1,277.30	0.0148	2,399.78	0.0278	1,915.95	0.0222	3,059.25	0.0355
MONTANA	2	0	0	0	0.00	0.0000	0.00	0.0000	0.00	0.0000	0.00	0.0000
NEBRASKA	3	10,208	4	7	124.34	0.0049	870.15	0.0345	124.34	0.0049	1,372.55	0.0545
NEVADA	2	0	0	0	0.00	0.0000	0.00	0.0000	0.00	0.0000	0.00	0.0000
NEW HAMPSHIRE	3	2,597	3	6	185.42	0.0289	284.17	0.0443	422.11	0.0658	772.98	0.1205
NEW JERSEY	7	38,710	9	15	2,920.14	0.0306	4,454.36	0.0466	6,719.35	0.0703	11,159.93	0.1168
NEW MEXICO	1	0	0	0	0.00	0.0000	0.00	0.0000	0.00	0.0000	0.00	0.0000
NEW YORK	9	97,249	26	47	6,761.97	0.0282	9,237.47	0.0385	19,055.12	0.0793	27,322.60	0.1138
NORTH CAROLINA	11	0	0	0	0.00	0.0000	0.00	0.0000	0.00	0.0000	0.00	0.0000
NORTH DAKOTA	1	93	1	2	2.84	0.0123	8.34	0.0363	3.40	0.0148	8.77	0.0381
OHIO	17	84,050	35	59	3,324.86	0.0160	5,729.80	0.0276	4,264.67	0.0205	7,908.33	0.0381
OKLAHOMA	4	0	0	0	0.00	0.0000	0.00	0.0000	0.00	0.0000	0.00	0.0000
OREGON	3	7,501	5	9	457.44	0.0247	427.88	0.0231	944.98	0.0510	658.09	0.0355
PENNSYLVANIA	14	53,812	22	37	3,995.59	0.0254	7,488.96	0.0475	9,294.73	0.0590	20,678.85	0.1312
PUERTO RICO	4	432	1	2	28.96	0.0271	51.21	0.0480	50.01	0.0469	75.22	0.0705
RHODE ISLAND	2	4,505	3	5	321.99	0.0271	604.76	0.0510	790.34	0.0666	1,413.15	0.1191
SAMOA	0	0	0	0	0.00	0.0000	0.00	0.0000	0.00	0.0000	0.00	0.0000
SOUTH CAROLINA	5	0	0	0	0.00	0.0000	0.00	0.0000	0.00	0.0000	0.00	0.0000
SOUTH DAKOTA	2	2,180	2	4	65.78	0.0123	145.78	0.0273	78.94	0.0148	203.32	0.0381
TENNESSEE	6	5,551	4	7	331.91	0.0242	707.32	0.0516	508.09	0.0371	1,100.67	0.0803
TEXAS	28	1,891	2	4	46.08	0.0099	190.52	0.0408	46.08	0.0099	254.35	0.0545
TRUST TERRITORIES	0	0	0	0	0.00	0.0000	0.00	0.0000	0.00	0.0000	0.00	0.0000
UTAH	3	0	0	0	0.00	0.0000	0.00	0.0000	0.00	0.0000	0.00	0.0000
VERMONT	0	0	0	0	0.00	0.0000	0.00	0.0000	0.00	0.0000	0.00	0.0000
VIRGIN ISLANDS	0	0	0	0	0.00	0.0000	0.00	0.0000	0.00	0.0000	0.00	0.0000
VIRGINIA	8	8,527	7	12	442.45	0.0210	1,070.12	0.0508	911.46	0.0433	3,221.13	0.1530
WASHINGTON	6	20,449	11	14	1,177.58	0.0162	2,403.10	0.0330	2,364.54	0.0325	3,917.91	0.0538
WEST VIRGINIA	5	9,801	9	14	497.51	0.0234	901.17	0.0424	1,265.36	0.0596	2,626.26	0.1237
WISCONSIN	9	9,869	7	13	442.15	0.0185	730.27	0.0306	530.11	0.0222	846.44	0.0355
WYOMING	0	0	0	0	0.00	0.0000	0.00	0.0000	0.00	0.0000	0.00	0.0000
U.S. TOTALS	320	885,140	300	511	39,248.97		59,112.36		73,543.99		137,980.74	

Table 60

Selected Facilities for Urban Stormwater Pollution Control in Urbanized Areas

(Area in Hectares, Flow in 1000 m³/Day, Volume in 1000 m³)

Table 60 presents information which was developed as part of the cost estimating procedure for Categories V and VI of the 1980 Needs Survey. This urban stormwater pollution control data was developed for projected year 2000 conditions in Urbanized Areas as presented in Table 56. The storage and treatment requirements presented in Table 60 were estimated using the 1980 Needs Estimation Program (NEP-80) for the fish and wildlife, and recreation water quality objectives. The fish and wildlife objective was based on eliminating low dissolved oxygen events (less than 2.0 mg/l) and ensuring that SS concentrations in stormwater would be less than or equal to background SS concentrations in the receiving water. The recreation objective was based on scaling up the facilities required to meet the fish and wildlife objective such that a 95 percent removal of fecal coliform organisms would be obtained. A brief description of the basis for Catego.y V and VI cost estimates is presented in Appendix B. The following items are contained in Table 60:

Number of Urbanized Areas: The total number of Urbanized Areas as defined in Appendix B, listed by State. This item is the same as presented in Table 56.

Stormwater Runoff Area (2000): The Urbanized Area, in hectares, which contributes stormwater runoff based on projected year 2000 population estimates, listed by State. This item is the same as presented in Table 56.

Number of Stormwater Treatment Plants: The total estimated number of stormwater treatment plants required to meet the fish and wildlife water quality objective in Urbanized Areas, listed by State.

Number of Stormwater Storage Basins: The total estimated number of stormwater storage basins required to meet the fish and wildlife water quality objective in Urbanized Areas, listed by State.

Total Stormwater Treatment Capacity for Fish and Wildlife: The total estimated stormwater treatment capacity, in 1000 m³/day, required to meet the fish and wildlife water quality objective, listed by State.

Average Stormwater Unit Treatment Capacity for Fish and Wildlife: The estimated average stormwater unit treatment capacity, in 1000 m³/day/hectare, required to meet the fish and wildlife water quality objective, listed by State.

Total Stormwater Treatment Capacity for Recreation: The total estimated stormwater treatment capacity, in 1000 m³/day, required to meet the fish and wildlife water quality objective, listed by State.

Average Stormwater Unit Treatment Capacity for Recreation: The average estimated stormwater unit treatment capacity, in 1000 m³/day/hectare, required to meet the recreation water quality objective, listed by State.

Total Stormwater Storage Capacity for Fish and Wildlife: The total estimated stormwater storage capacity, in 1000 m³, required to meet the fish and wildlife water quality objective, listed by State.

Average Stormwater Unit Storage Capacity for Fish and Wildlife: The average estimated stormwater unit storage capacity, in 1000 m³/day/hectare, required to meet the fish and wildlife water quality objective, listed by State.

Total Stormwater Storage Capacity for Recreation: The total estimated stormwater storage capacity, in 1000 m³, required to meet the recreation water quality object, listed by State.

Average Stormwater Unit Storage Capacity for Recreation: The average estimated stormwater unit storage capacity, in 1000 m³/hectare, required to meet the recreation water quality objective, listed by State.

STATE	# OF UA'S	TOTAL SW AREA	PLANTS	BASINS	FISH & WILDLIFE TREATMENT TOTAL	UNIT	STORAGE TOTAL	UNIT	RECREATION TREATMENT TOTAL	UNIT	STORAGE TOTAL	UNIT
ALABAMA	9	244,034	53	84	10,124.05	0.0168	27,523.34	0.0455	16,446.63	0.0305	50,211.09	0.0831
ALASKA	1	50,978	8	13	931.60	0.0074	4,760.06	0.0376	2,173.74	0.0173	7,165.96	0.0569
ARIZONA	2	322,597	26	40	5,330.58	0.0070	23,040.25	0.0297	7,660.42	0.0099	26,520.77	0.0333
ARKANSAS	4	84,957	20	32	3,174.74	0.0151	9,550.73	0.0455	5,023.60	0.0278	17,047.92	0.0851
CALIFORNIA	16	1,490,742	141	221	37,284.95	0.0107	96,029.10	0.0276	80,533.04	0.0232	186,022.46	0.0535
COLORADO	4	209,909	27	43	3,304.44	0.0066	14,429.96	0.0285	4,992.63	0.0099	16,907.12	0.0334
CONNECTICUT	12	240,557	64	102	11,204.35	0.0189	23,853.19	0.0402	24,698.98	0.0419	83,589.80	0.1407
DELAWARE	1	36,011	7	11	1,020.62	0.0173	4,137.62	0.0441	3,930.29	0.0419	13,203.73	0.1407
DISTRICT OF COLUMBIA	1	20,050	8	10	952.39	0.0148	2,783.55	0.0433	2,698.42	0.0419	9,051.49	0.1407
FLORIDA	15	1,047,544	132	200	42,940.22	0.0166	105,022.31	0.0406	79,663.64	0.0308	213,901.05	0.0827
GEORGIA	7	295,575	42	67	10,803.00	0.0148	32,169.97	0.0441	21,050.98	0.0288	60,945.54	0.0835
GUAM	0	0	0	0	0.00	0.0000	0.00	0.0000	0.00	0.0000	0.00	0.0000
HAWAII	1	50,081	9	14	1,035.01	0.0074	3,379.74	0.0241	2,762.10	0.0197	7,967.55	0.0569
IDAHO	1	15,599	5	8	380.10	0.0099	1,120.15	0.0291	475.12	0.0123	1,282.43	0.0333
ILLINOIS	13	407,855	67	107	10,044.65	0.0100	29,695.50	0.0295	14,490.05	0.0144	41,814.95	0.0415
INDIANA	10	330,264	52	83	9,177.52	0.0113	22,119.83	0.0271	12,096.59	0.0148	33,855.01	0.0415
IOWA	7	130,061	37	59	3,304.49	0.0099	10,306.37	0.0304	4,304.42	0.0128	14,154.50	0.0415
KANSAS	4	304,382	31	49	7,410.59	0.0099	22,211.19	0.0290	9,206.27	0.0123	31,200.75	0.0415
KENTUCKY	6	139,237	29	45	5,220.56	0.0152	14,819.19	0.0431	13,470.98	0.0392	48,530.84	0.1412
LOUISIANA	7	131,542	35	56	5,809.07	0.0179	14,468.38	0.0445	10,129.51	0.0312	27,009.52	0.0831
MAINE	2	62,094	14	22	2,274.50	0.0147	5,074.85	0.0328	6,492.30	0.0419	21,777.75	0.1407
MARYLAND	2	143,109	22	34	10,205.32	0.0209	20,911.12	0.0427	22,273.34	0.0455	66,281.80	0.1353
MASSACHUSETTS	11	390,491	66	105	20,217.23	0.0206	40,058.97	0.0409	43,508.31	0.0445	135,192.46	0.1380
MICHIGAN	13	355,005	64	109	10,033.98	0.0114	27,625.71	0.0314	15,130.11	0.0172	35,117.82	0.0399
MINNESOTA	6	262,114	26	45	6,105.38	0.0095	19,079.58	0.0295	7,948.86	0.0123	26,909.90	0.0416
MISSISSIPPI	3	48,402	14	23	1,654.49	0.0155	4,623.73	0.0404	3,624.08	0.0303	9,691.49	0.0828
MISSOURI	5	257,509	35	55	6,699.36	0.0109	19,196.28	0.0302	8,599.39	0.0135	26,396.88	0.0415
MONTANA	2	10,824	7	12	209.97	0.0049	1,344.69	0.0324	409.96	0.0099	1,464.22	0.0352
NEBRASKA	3	50,995	13	21	1,242.54	0.0099	4,054.43	0.0322	1,547.40	0.0123	5,238.73	0.0416
NEVADA	2	96,192	15	24	1,171.91	0.0049	7,170.05	0.0302	1,907.77	0.0080	8,371.70	0.0352
NEW HAMPSHIRE	3	101,203	23	35	8,773.95	0.0220	16,610.52	0.0417	17,711.46	0.0445	54,921.29	0.1379
NEW JERSEY	7	823,732	51	80	39,514.01	0.0194	81,747.79	0.0402	90,594.52	0.0485	267,793.26	0.1317
NEW MEXICO	1	69,986	8	13	686.72	0.0099	3,993.49	0.0324	1,217.44	0.0099	4,107.59	0.0333
NEW YORK	9	220,819	50	80	9,355.10	0.0172	24,320.18	0.0446	22,667.34	0.0416	76,030.87	0.1395
NORTH CAROLINA	11	198,900	56	90	7,209.03	0.0148	22,357.33	0.0455	13,403.22	0.0273	41,901.25	0.0853
NORTH DAKOTA	1	36,277	3	5	90.44	0.0074	396.36	0.0304	96.44	0.0074	603.89	0.0463
OHIO	17	578,873	94	150	16,500.01	0.0115	37,455.54	0.0262	23,814.08	0.0167	57,490.65	0.0402
OKLAHOMA	4	209,969	27	43	5,111.99	0.0099	15,950.90	0.0308	6,388.45	0.0123	21,480.54	0.0415
OREGON	3	102,700	23	35	6,431.31	0.0160	10,938.88	0.0272	11,643.03	0.0290	20,365.39	0.0507
PENNSYLVANIA	14	639,788	72	115	16,101.92	0.0169	44,400.47	0.0414	45,775.88	0.0426	148,780.74	0.1386
PUERTO RICO	4	45,550	16	26	1,563.90	0.0141	4,842.93	0.0431	3,061.33	0.0274	9,530.59	0.0847
RHODE ISLAND	2	47,513	10	16	2,290.51	0.0196	4,533.81	0.0388	4,882.45	0.0416	16,550.71	0.1411
SAMOA	0	0	0	0	0.00	0.0000	0.00	0.0000	0.00	0.0000	0.00	0.0000
SOUTH CAROLINA	5	100,132	26	42	3,605.94	0.0148	11,704.97	0.0455	7,236.43	0.0281	21,681.23	0.0843
SOUTH DAKOTA	2	10,391	5	9	107.43	0.0073	708.55	0.0300	189.89	0.0076	1,189.10	0.0463
TENNESSEE	6	275,505	43	68	10,550.08	0.0155	30,229.07	0.0444	20,630.33	0.0303	56,216.16	0.0826
TEXAS	26	1,177,380	201	318	41,616.20	0.0095	132,791.40	0.0303	55,020.03	0.0126	183,378.56	0.0418
TRUST TERRITORIES	0	0	0	0	0.00	0.0000	0.00	0.0000	0.00	0.0000	0.00	0.0000
UTAH	3	90,392	18	29	1,174.35	0.0049	5,013.90	0.0211	2,348.69	0.0099	8,080.31	0.0340
VERMONT	0	0	0	0	0.00	0.0000	0.00	0.0000	0.00	0.0000	0.00	0.0000
VIRGIN ISLANDS	0	0	0	0	0.00	0.0000	0.00	0.0000	0.00	0.0000	0.00	0.0000
VIRGINIA	6	139,083	57	90	15,615.21	0.0159	44,888.39	0.0456	38,674.31	0.0393	138,783.05	0.1409
WASHINGTON	5	291,713	37	60	9,177.50	0.0156	18,462.06	0.0309	16,476.09	0.0276	30,966.26	0.0519
WEST VIRGINIA	5	32,174	15	25	1,198.22	0.0148	3,715.59	0.0459	2,968.73	0.0367	11,666.30	0.1441
WISCONSIN	9	263,972	50	80	6,260.10	0.0095	16,440.65	0.0250	9,214.24	0.0140	27,264.49	0.0415
WYOMING	0	0	0	0	0.00	0.0000	0.00	0.0000	0.00	0.0000	0.00	0.0000
U.S. TOTALS	326	13,374,903	1,959	3,047	436,110.06		1,143,077.18		832,098.08		2,426,342.72	

Appendix A

The 1980 Needs Survey Conduct of the Survey Categories I-IV (Treatment Plants and Sewers)

Background

As in previous Surveys, the goal of the 1980 Needs Survey was to identify and quantify all needs on a nationally uniform basis. Further, the inventory of municipal wastewater facilities compiled previously would be updated and expanded for completeness.

As in the 1976 and 1978 Surveys, the 1980 Survey was accomplished with the assistance of a contractor. The two main purposes for performing the Survey with contractor assistance were:

1. To achieve as high a degree of national consistency in the final estimates as possible through the use of uniformly applied guidelines and validation techniques.

2. To minimize the time required of State and EPA Regional Construction Grants staff.

URS Company of Denver, Colorado was competitively selected to estimate needs in Categories I-IV. CH2M Hill of Gainesville, Florida and Sage Murphy & Associates, Inc. of Denver, Colorado assisted in the Survey as subcontractors to URS.

Conduct of the Survey

The 1980 Needs Survey was a more centralized effort than past Surveys. All data analysis was performed in Denver, Colorado to assure national consistency in the estimation process. Contractor personnel visited EPA Regional and State offices as necessary for data collection and consultation.

Survey guidance and methodology were formulated for Categories I-IV and circulated to all parties involved in the Survey. The guidance document was prepared as an update from the guidance used in prior Surveys.

The formal Survey of Categories I-IV began with orientation meetings conducted in EPA Regional offices where logistics, target dates, and individual State problems were discussed and resolved. States were invited to provide as much investment in personnel for the Survey as they considered prudent.

The Survey field work was conducted in the spring, summer, and fall of 1980. As estimates for Categories I-IV were completed, copies of the estimates were reviewed by States on a facility-by-facility basis. In a few cases, separate cost estimates were submitted by States when agreement beween EPA and State personnel could not be reached.

Population projections from the Bureau of Economic Analysis for the year 2000 were used as State ceilings. State population projection totals were not permitted to exceed these ceilings.

Facility estimates were reviewed and accepted and/or approved at four levels:

1. Contractor
2. State
3. EPA Regional Office
4. EPA Headquarters

After updating the Needs Survey computer data base with 1980 Survey information, data for Categories I-IV were summarized for this report.

Survey Methodology

Participant guidance for the Survey was formulated by EPA, the States, and the contractor to insure national uniformity in needs assessment while recognizing cost and construction differences inherent to various sections of the country. Set forth in the guidance were directives outlining:

1. Responsibilities of the participants.

2. Survey chronology, including target dates for project milestones.

3. Descriptions of types of data sources.

4. Instructions for review of individual facilities by contractor personnel and adjustments to the 1978 data of record.

5. Provisions for State and Regional review of Survey forms.

6. Definitions of terms for Survey purposes such as levels of treatment, design year, and per capita flows.

7. Detailed cost estimating procedures, including procedures for estimating backlog needs for all categories.

8. Local construction cost indices.

9. Treatment plant, sewer, and pump station sizing and cost estimating tables.

The 1980 Needs Survey differed from prior Surveys in several areas. These include:

1. The needs assessment effort was centralized to assure national consistency.

2. The incremental cost for achieving treatment levels greater than secondary are reported in Category II. Advanced secondary treatment incremental cost are reported in category IIA and incremental advanced treatment cost are reported in Category IIB.

3. More accurate techniques for estimating needs in small communities were provided, including the provision for estimating costs of individual systems.

4. More attention was placed on multi-purpose projects, with ineligible or nonpollution control related costs documented on a separate worksheet.

5. Greater use was made of computers for cost estimating, logging, and quality assurance functions.

Basis of cost Estimate for Categories I-IV

All individual cost estimates prepared or obtained for Categories I-IV of the Survey were assigned a basis that provides an indication of the quality of the estimate. The quality of cost estimates are assigned codes which are defined as follows:

1. State Certification - Applicable to Category IIIA only, this code relates certifications by the State that excessive infiltration/inflow does or does not exist. It was not used in this Survey as a basis of estimate.

2. Analysis Completed - For Category IIIA estimates obtained froma cost analysis in an I/I reort.

3. Evaluation Survey Completed - An estimate of cost based on the results of a Sewer System Evaluation Survey (SSES), used only for Category IIIA or IIIB.

4. Engineer/Consultant Firm Estimate - An estimate of cost based on detailed engineering work such as completed Step II plans and specifications.

5. Cost of Previous Comparable Construction - This estimate of cost is based on the cost of a nearby, recently completed project which is similar in size and scope, and for which detailed construction cost are available.

6. Engineer/Consultant Preliminary Estimate - An estimate of cost based on a completed Step I or other facilities plan.

7. EPA-Supplied Cost Estimating Procedures - Cost estimated using EPA rule of thumb estimating techniques as described in the Survey guidance.

8. Cost Effective Analysis - This is an estimate drived from comparative economic evaluation for which a compiled Step I facilities plan is not available, or a rough estimate obtained from a 208 or other areawide plan.

The accuracy of the cost estimates can be ranked from high order to low, as follows:

Categories I, IIA, IIB, IVA, IVB:
Codes 4, 6, 5, 8, 7,
Categories IIIA, IIIB:
Codes 4, 3, 6, 2, 8, 5, 7, 1

Category I-V Data Collection

Many sources of data were used in assessing and updating needs for individual facilities. For most of these facilities, information was obtained concerning present and projected population, flows, treatment plant loading, discharge limitations, ad treatment and sludge handling methods. The data sources include:

1. 1978 Needs Survey

2. NPDES Permit

3. Regional Grant File

4. Engineering Plans and Reports

5. EPA Grants Information and Control System (GICS) Data

6. State Water Quality Standards

Survey Preparation

The 1980 Survey form for each facility was generated by computer showing the 1978 data of record. Revised or updated cost estimates and related information were obtained for each facility as applicable and entered on the form. Copies of updated forms were sent to the States and EPA Regional offices for review. Upon completion of the review, final changes were made to the form and the information was entered into the 1980 Survey data base by computer.

The 1980 Needs Survey was noteworthy for its increased level of automation, efficiency, and accuracy over prior Surveys. The Survey data base was expanded somewhat by the addition of new facilities, and existing data were improved and new data entered. The final results of the Survey reported herein represent a higher degree of reliability and accuracy yet achieved, and the accumulation of more data on the nation's wastewater systems than has ever before been known.

Conduct of The Survey Categories V and VI (Combined Sewer Overflow [CSO] and Urban Stormwater Runoff [SWR])

Background

Prior to the 1980 Needs Survey, the Category V and VI portions of the Needs Survey were developed under a contract separate from the Category I-IV portions. The only common ground between the two portions of the survey was the data collection process. To consolidate all categories of the Needs Survey, it was decided that the 1980 Needs Survey would be conducted under one contract. It was also decided that Category V and VI estimates would be developed on a facility-by-facility basis rather than on a state-by-state basis as done in past surveys.

Basis of Cost Estimates for Categories V and VI

The needs estimation procedure utilized for Categories V and VI during the 1980 Survey was very similar to procedure utilized during the 1978 Survey. Ten combined sewer site studies were conducted to develop transferable criteria, principles, and relationships which could be applied nationwide to esitmate wet-weather POTW needs. These included design criteria, pollutant removal requirements, and the selection of appropriate pollution control technologies. Specific tasks which were performed to accomplish these general objectives included the following:

1. Determine if a particular urban area/receiving water system is presently experiencing a receiving water quality problem.

2. If a problem exists, determine how much of the problem is due to CSO and SWR pollution.

3. Determine the level of pollutant removal required to achieve selected water quality objectives.

4. Determine an optimum or least costly combination of CSO and SWR control alternatives to obtain the desired pollutant removal.

These tasks were performed using a receiving water simulation program called the "Continuous Stormwater Pollution simulation System" (CSPSS) and an economic optimization program called the "Computer Optimized Stormwater Treatment" (COST) program.

The 10 combined sewer study sites selected for the 1980 Needs Survey were located at the same cities selected for the 1978 Survey. In general, these sites were selected to provide a wide range in the size of the combined sewer system and a representative distribution across the U.S.. Since Category VI facilities are not currently eligible for Federal assistance, and since several of the combined study sites contain both combined and separately sewered areas, additional separately sewered site studies, which were considered in the 1978 Survey, were not continued for the 1980 Survey.

Site study results were analyzed to develop specific relationships between an urban area with combined sewers and the CSO pollutant removal required to meet specific water quality objectives. In addition, criteria and specific relationships for selecting appropriate wet-weather pollution control technologies were developed from site study results. All of these relationships and criteria were incorporated into a Needs Estimation Program (NEP-80) for developing estimates of Category V and VI needs for each individual Urbanized Area in the United States.

Approximately 27 percent of the total national combined sewer area is located in small towns and cities outside of census-defined urbanized areas. Category V needs were estimated for these facilities by application of linear regression equations derived from population, drainage area, and Category V cost data developed for the Urbanized Areas. That is Category V needs were expressed as a linear function of combined sewer service area and population served, and these functions were utilized to establish Category V needs estimates for combined sewer systems located in non-Urbanized Areas.

As with the 1978 Survey, Category V and VI cost estimates were developed for three receiving water use objectives: aesthetics, fish and wildlife, and recreation. For the 1980 Survey, the aesthetics objective was based on obtaining a 40 percent removal of BOD and SS using best management practices. The fish and wildlife objective was based on eliminating flow dissolved oxygen events (i.e., less than 2.0 mg/l) and ensuring that SS concentrations in CSO were less than or equal to background SS concentrations in receiving water. The recreation objective was based on scaling up the facilities required to meet the fish and wildlife objective such that a 95 percent removal of fecal coliform organisms would be obtained.

The major enhancements of the 1980 category V estimates over prior estimates include the following items:

1. Economic optimization techniques were better utilized to indentify the best mix of wet-weather pollution abatement alternatives and cost-effective design criteria.

2. Site-specific stormwater storage and transmission costs were considered.

3. Facility plan cost estimates were used where feasible.

Combined Sewer System Data File

The inventory of combined sewer systems in the U.S. developed during the 1980 Needs Survey using the combined sewer system worksheet described in Appendix D. The combined sewer dta collection process was performed in conjunction with all other data collection for the 1980 Survey. A total of 1,118 combined sewer worksheet were completed to the extent possible with readily available data. Since not all data items on the worksheet are readily available from published reports, the data file is not complete for each worksheet. The worksheet is segmented into 5 major sections as follows:

1. Identification and combined sewer system data.

2. Receiving water characteristics

3. Status of CSO abatement projects

4. Grant information.

5. Grant-eligible cost estimates

Data from sections 1 and 2 of the worksheets for the 1980 Needs Survey are summarized in Table 54 and 55 of Chapter 4.

Urbanized Area Data Base

The Urbanized Area Data Base is a subset of the Combined Sewer System Data File. In the regulations for the application of the NPDES Permit Program to separate storm sewers, the term "separate storm sewer" is defined as "a conveyance or system of conveyances. . .located in an Urbanized Area and primarily operated for the purpose of collecting and coveying stormwater runoff (1)." Based on this definition, the Urbanized Areas, as designted by the U.S. Bureau of the Census, are used as the geographical areas which require control and/or treatment of urban stormwater runoff. Therefore, needs estimation for both Categories V and VI are required within Urbanized Areas.

The specific criteria for the delineation of an Urbanized Area are as follows:

1. A central city of 50,000 inhabitants or more, or twin cities with a combined population of at least 50,000, and with the smaller of the twin cities having a population of at least 15,000.

2. Surrounding closely settled territory, including the following:
   a. Incorporated places of 2,500 inhabitants or more.

   b. Incorporated places with fewer than 2,500 inhabitants, providing that each has a closely settled area of 100 housing units or more.

   c. Small parcels of land normally less than one square mile in areas having a population density of 1,000 inhabitants or more per square mile.

   d. Other similar small areas in unincorporated territory with lower population density provided that they serve to eliminate enclaves, or to close indentations in the urbanized areas of 1 mile or less across the open end, or to line outlying enumeration district of qualifying density that are not more than 1-1/2 miles from the main body of the Urbanized Area.

As of January 1, 1978, there were 279 Urbanized Areas defined in the nation. Thirty-five of the Urbanized Areas defined in the nation. Thirty-five of the Urbanized Areas encompassed area in two States. By subdividing by State the Urbanized Areas encompassing lands in more than one State, a total of 320 Urbanized areas were defined for estimation of Category V and VI needs.

The Urbanized Area Data Base consists primarily of the following items, some of which were obtained from the National Combined Sewer System Data File and the remainder from other published sources.

1. Demographic data.

   a. The items in this category are the combined sewer service area and the population served by combined sewers, the Urbanized Area population and size, the year 1970 SMSA population, the year 2000 SMSA population estimate, and the citywide EPA construction cost factor.

2. Hydrologic data.

   a. The items in this category are the number of days with rain per year, the mean annual rainfall, the receiving water classification the mean annual flow of the receiving water, and the natural runoff coefficient.

3. Water quality data.

a. The items in this category are maximum monthly receiving water temperature, background BOD, suspended solids, lead, hardness, alkalinity, and pH of the receiving water.

Sources of Data

Sources of data for the National Combined Sewer System Data File included the following:

1. NPDES files in EPA Regional Offices.

2. USGS Water Resources Data

3. Grants file

4. 201 Plans

5. 208 Plans

6. Telephone contact with municipalities

Sources of data for the Urbanized Area Data Base are given as follows:

1. Demographic data.

a. The combined sewer service area and the population served by the combined sewers were taken from the National Combined Sewer System Data File for those systems located within Urbanized Areas.

b. Urbanized Area popluation and size were reported in the supplemen ary report of the 1970 census of population (2).

c. 1970 SMSA population was reported in the "Current Population Reports Series (3)."

d. Year 2000 SMSA population estimates were reported from the U.S. Water Resources Concil's OBERS Projections (4).

e. Citywide EPA construction cost factor was taken from EPA Municipal Construction Cost Index Map, Wastwater Treatment Plants, City muitipliers.

2. Hydrologic data.

a. The number of days with rain per year and the mean annual rainfall were obtained from the National Oceanic and Atmospheric Administration (5).

b. Receiving water data were obtained from the National Combined Sewer System Data File and from USGS water resources data (6).

c. Natural runoff coefficients were obtained from USGS Water Supply Paper 1797—"Has the United States Enough Water?" (7).

3. Water quality data.

a. Background water quality data were obtained from the Assessment of Water Pollution from Nonpoint Sources (8).

References

1. Federal Register, 40 CFR Parts 124, 125, National Pollutant Discharge Elimination System—Separate Storm sewers, Final Regulations. 18 March 1976.

2. Supplemental report 1970 Census of Population, PC (S7)-106 Population of Urbanized areas established in the 1970 census for the United States. 1970

3. Population estimates and projections, P-25, No. 709. Estimates of the population of counties and metropolitan areas. 1 July 1974 and 1975.

4. U.S. Water Resources Council, 1972, OBERS Projections of Economic Activity in the U.S., Volume IV—States, Volume V—Standard Metropolitan Statistical Areas, Washington, D.C.

5. U.S. Department of Interior, Geological Survey, "Water Resources Data for the United States." Published annually fo each State.

7. Piper, A.M. Has the United States Enough Water? *U.S. Geological Survey Water Supply Paper 1797.* U.S. Government Printing Office Washington, D.C.

8. Me Elroy, A. D., et al. Loading Functions for Assessment of Water Pollution from Nonpoint Sources. *EPA 600/2-76/151. May 1976*

Appendix C

Figure C-1 ►

The 1980 Needs Survey Descriptions of The 1980 Survey Form

The principal instrument of the 1980 Needs Survey was the EPA-1 form shown in Figure C-1 and C-2. The updated 1978 Survey data of record were printed on this form and copies distributed to cognizant Federal, State, and contractor personnel. One form was completed for each facility identified in the 1978 Needs Survey. The data of record were then updated in accordance with the methodology presented in Appendix A.

The form is designed to allow a large quantity of data to be compiled for each sewerage facility. This is made possible by an elaborate data coding system which allows a huge quantity of data to be entered in a compact form and permits it to be easily checked by computer for accuracy and completeness. The codes used to complete each item on the form (Figure C-1) are defined on the reverse side of the form (Figure C-2).

Listed below is a brief explanation of each item on the 1980 Needs Survey EPA-1 form.

1. **State/Authority/Facility Number:** This is a discrete nine digit number assigned to each facility. The first two digits designate a particular State or Territory and are obtained from the Federal Information Processing Standard for designating States and outlying areas of the U.S. (FIPS-5). The next four numbers designate a particular municipal sewerage authority and are assigned sequentially by each State. The last three digits designate a particular sewerage facility and are assigned sequentially by each municipal sewerage authority.

2. **Facility Name:** The official name of the facility.

3. **Authority Name:** The name of the authority having responsibility for the facility.

4. **Zip Code:** The official postal service zip code of the facility.

5. **Submission Code:** This is a one digit number which indicates whether the need of the facility changed since the 1978 Survey, or whether the facility was even included in the 1978 Survey.

6. **Grant Number:** The four digit number of the most recent EPA construction grant which applies to the facility.

7A. **Farmers Home Administration Eligibility:** An "X" in this block indicates that the facility is eligible for Economic Development Administration financial assistance.

7B. **Economic Development Administration Eligibility:** An "X" in this block indicates that the facility is eligible for Economic Development Administration financial assistance.

8. **NPDES Number(s):** The National Pollutant Discharge Elimination System permit number(s) assigned to the facility through the EPA permit program.

9. **County Number:** The three digit FIPS-6 number used to identify the county in which the facility is located.

10. **SMSA Number:** The number of the Standard Metropolitan Statistical Area in which a facility is located.

11. **Basin Number:** The four digit number for the river drainage basin in which the facility is located according to the EPA major/minor basin code scheme.

12. **Congressional District:** The number of the Congressional district in which the facility is located.

13. **Comment Codes:** Three spaces are provided for one digit codes which represent standardized comments used to explain any anomalies present in the coding convention used to describe the facility. The standard comments are listed on the reverse side of the form. Space is also provided on the reverse side for listing more extensive plain language comments.

14. **City:** The name of the community in which the facility is located.

15. **County:** The name of the county in which the facility is located.

16A. **Facility Status:** A one digit code which indicates whether or not a facility is currently in operation.

16B. **Present Nature of Facility:** A one digit code which describes the present type of facility in operation codes are defined on the reverse side of the form.

16C. **Projected Nature of Facility:** A one digit code which describes the type of facility projected to be in operation in 2000. The codes are defined on the reverse side of the form.

16D. **Projected Change:** A one digit code which describes any physical changes expected at the facility by 2000. The codes are defined on the reverse side of the form.

16E. **Start Up Date:** The month and year a facility became, or is expected to become, operational.

16F. **Abandonment Date:** The month and year a facility will be abandoned, if applicable.

FORM EPA-1
(4-18-79)

ENVIRONMENTAL PROTECTION AGENCY
ESTIMATE OF MUNICIPAL WASTEWATER TREATMENT FACILITY REQUIREMENTS

This report is required by law (33 U.S.C. 1251 ET SEQ). While you are not required to respond, your cooperation is needed to make the results of this survey comprehensive, accurate, and timely.

Form Approved
O.M.B. No. 158-R0139

1. State/Authority/Fac. No.	2. Facility name	3. Authority name	4. ZIP	5. Sub code

6. Grant No.	7. Eligibility FmHA ¦ EDA	8. NPDES No.(s)	9. County No.	10. SMSA	11. Basin	12. Cong. dist.	13. Comment codes	

14. City	15. County name	16a. Fac. status	b. Nat. present	c. Nat. proj.	d. Chng.	e. Date start-up	f. Date abandon

17. SUMMARY OF CATEGORY NEEDS

Category	Cost of record *(Bil./Mil./Thou.)* (a)	New and/or revised cost *(Bil./Mil./Thou.)* (b)	Portion required to satisfy backlog *(Bil./Mil./Thou.)* (c)	Basis of est. (d)	Reason for sep. est. (e)
I	(1)				
IIA	(2)				
IIB	(3)				
IIIA	(4)				
IIIB	(5)				
IVA	(6)				
IVB	(7)				

19. NEED FOR NEW COLLECTORS, INTERCEPTORS, FORCE MAINS, AND PUMPING STATIONS

Type (a)	Diam. *(in.)* number (b)	Length *(ft.)* Capacity *(MGD)* (c)	Cost *(Bil./Mil./Thou.)* (d)
(1)			
(2)			
(3)			
(4)			
(5)			
(6)			
(7)			
(8)			
(9)			
(10)			
(11)			
(12)			

18. FACILITY POPULATION

	Present resident (a)	Present nonresident (b)	Proj. resident (c)	Proj. nonresident (d)
RCV. TREATMENT	(1)			
NO TREATMENT	(2)			
RCV. COLLECTION	(3)			
NOT RCV. COLLECTION	(4)			

20. DISPOSAL OF LIQUID EFFLUENTS

CODES

Disp. (a)	Use (b)	Chng. (c)
(1)		
(2)		
(3)		
(4)		

21. I/I Codes

22. Est. I/I flow

23. Maj. rehab./rep. required — Code

24. Do wastewaters originate in communities existing before October 18, 1972?

25. 1972 population requiring collection

26. Effluent characteristic — Present / Future

27. Reasons

28. Supplemental sheets

29. FLOWS/CONCENTRATIONS, MONTHLY AVERAGE

	Existing (a)	Present design (b)	Projected design (c)
TOTAL FLOW *(MGD)*	(1)		
INDUS. FLOW *(MGD)*	(2)		
DOM. FLOW/CAP *(GPCD)*	(3)		

	Influent (d)	Effluent (e)	Influent (f)	Effluent (g)	Influent (h)	Effluent (j)
BOD$_5$ *(mg/l)*	(4)					
SUS. SOLIDS *(mg/l)*	(5)					
PHOSPHORUS *(mg/l)*	(6)					
AMMONIA *(mg/l)*	(7)					
30. OTHER (code)	(1)	(2)	(3)	(4)	(5)	(6)
OTHER (code)	(7)	(8)	(9)	(10)	(11)	(12)

31a. Receives discharge from

b. Discharges to

32. TREATMENT AND SLUDGE HANDLING *(Codes)*

TR a	Use b	CH c	TR a	Use b	CH c	TR a	Use b	CH c	TR a	Use b	CH c
(1)			(3)			(5)			(7)		
(2)			(4)			(6)			(8)		

32. TREATMENT AND SLUDGE HANDLING *(Codes)* — Continued

TR (a)	Use (b)	Chng. (c)
(9)		
(10)		
(11)		
(12)		
(13)		
(14)		
(15)		
(16)		
(17)		
(18)		
(19)		
(20)		

QUESTIONNAIRE COMPLETED BY

Signature	Date

ACCEPTANCE

STATE AGENCY		EPA REGIONAL OFFICE	
Signature	Date	Signature	Date

Authority and facility number

NOTE – Indicate revised figures in appropriate shaded areas.

CODE REFERENCE CHART

Item 5 – Submission Code
1 – No change from 1978
2 – Facility not reported in 1978
3 – Change from 1978

Item 13 – Comment Codes
2 – Excess I/I is cost effective to treat
3 – Package plant for exact required capacity is not available
4 – Total flow is minimum that can be shown on the form due to format restrictions
5 – Existing plant has excess capacity now to treat 2000 population
6 – No sludge handling facility since sludge is pumped to another facility
7 – Receives flow from other facilities
8 – Flow diverted to other facility
9 – Additional comments on form

Item 16a – Facility Status
1 – In operation
2 – Not in operation

Item 16b, 16c – Nature of Facility
1 – A complete wastewater treatment system (includes a treatment plant, with associated collector and/or interceptor sewers, and methods for disposal of effluent, under control of the same treatment authority) with combined sewers. Code "A" for interim treatment plant.
2 – A complete wastewater treatment system (includes a treatment plant, with associated collector and/or interceptor sewers, and methods for disposal of effluent, under control of the same treatment authority) with separate sewers. Code "B" for interim treatment plant.
3 – A separate treatment plant. (The sewers which discharge to this plant are under the control of one or more different authorities.) Code "C" for interim treatment plant.
4 – A separate municipal wastewater collection system. (Includes one or more connected collector and/or interceptor sewers, force mains, pumping stations, etc., which either discharge without treatment or discharge to a facility controlled by a different authority. Do not include combined sewers or storm sewers.)
5 – A separate combined sewer system. (Includes one or more interconnected sewers which carry both sanitary wastewaters and storm waters, and which either discharge without treatment or to a facility operated by another authority. If facility includes both separate sanitary sewers and combined sewers, report as combined.)
6 – Other
7 – A system for the bulk transmission of wastewater with or without pumping stations, and with or without interceptor sewers.
8 – Sludge handling facilities, including vehicles or vehicle fleets.
9 – Individual or community septic system

Items 16d, 20c, and 32c – Projected Change
1 – Enlarge
2 – Upgrade
3 – Enlarge and upgrade
4 – Install in new plant
5 – Replace
6 – Abandon
7 – No change
8 – Other
9 – Abandon treatment plant, retain sewers

Item 17d – Basis of Estimate
1 – State certification
2 – Analysis completed
3 – Evaluation survey completed
4 – Engineer/consultant firm estimate

Item 17d – Continued
5 – Cost of previous comparable construction
6 – Engineer/consultant preliminary estimate
7 – EPA – supplied cost estimating procedures
8 – Cost effective analysis
9 – Rough estimate
A – Grant award

Item 17e – Reasons for Separate State Estimates
1 – State used locally or self-developed cost cures or cost estimating procedure
2 – State estimates based on larger projected per capita flow
3 – State disagreement with selected collection/treatment alternatives
4 – State estimate submitted without adequate documentation
5 – States estimates based on incomplete or unapproved engineering reports
6 – State population projections differ from allowable ceilings or reports
7 – Reserved for later use
8 – Reserved for later use
9 – Reserved for later use
0 – Other *(Explain on reverse side of EPA-1 form in comments section)*

Item 19a – New Collectors, Interceptors, Force Mains, and Pumping Stations
CS – Collector sewers
IS – Interceptor sewers
FM – Force Main
PS – Pumping Station
FF – Outfall sewers
SF – Ocean outfall sewers

Item 20a – Disposal of Liquid Effluents
1 – Outfall to surface waters
2 – Ocean outfall
3 – Holding pond
4 – Deep well
5 – Ground water recharge
6 – Other land disposal
7 – Recycling and reuse
8 – Septic tank field
9 – Other
0 – No discharge
A – Spray irrigation
B – Ditch irrigation
C – To other wastewater treatment plant

Items 20b and 32b – Use codes
1 – Now in use
2 – Under construction or provided for in approved grant
3 – Required, but not yet approved or funded
4 – Not applicable
5 – Installed but not in use

Item 21 (I/I) and Item 23 (Major Rehab.) Corrective Action
1 – Not known at this time
2 – None
3 – Seal off sewer lines
4 – Replace/reline sewer sections
5 – Change/create flow routing system
6 – Provide flow equalization
7 – Other corrective actions

Item 26 – Characteristic of Effluent
0 – No discharge
1 – Raw discharge
2 – Primary
3 – Advanced primary
4 – Secondary
5 – Advanced secondary
6 – Tertiary

Item 27 – Reason for Treatment More Stringent than Secondary
0 – A water quality plan which has been approved by EPA
1 – Order of State Court
2 – Order of Federal Court
3 – State permit or license
4 – NPDES permit or license
5 – State enforcement order or proceeding
6 – Federal enforcement order or proceeding
7 – Voluntary agreement which includes a schedule of compliance or improvements
8 – Other
9 – A certification by the State that the body of water receiving this discharge is water quality dependent, and that more stringent treatment is needed to meet Federally-approved water quality standards for dissolved oxygen or nutrients

Item 28 – Supplemental Sheets
1 – Toxic/other codes
2 – Additional treatments
3 – Recycle/reuse

Item 30 – Codes on Supplemental Sheet

Item 32a – Treatment and Sludge Handling

LIQUID TREATMENT PROCESSES

Primary Treatment
01 – Pumping, raw wastewater
02 – Preliminary treatment – bar screen
03 – Preliminary treatment – grit removal
04 – Preliminary treatment – comminutors
05 – Preliminary treatment – others
06 – Scum removal
07 – Flow equalization basins
08 – Preaeration
09 – Primary sedimentation

Secondary Treatment

Trickling Filter
10 – Trickling filter – rock media
11 – Trickling filter – plastic media
12 – Trickling filter – redwood slats
13 – Trickling filter – other media

Activated Sludge
14 – Activated sludge – conventional
15 – Activated sludge – high rate
16 – Activated sludge – contact stabilization
17 – Activated sludge – extended aeration
18 – Pure oxygen activated sludge

Other Secondary
19 – Bio-Disc (rotating biological filter)
20 – Oxidation ditch using mechanical aerators
21 – Clarification using tube settlers
22 – Secondary clarification

AWT

Biological Treatment
23 – Biological nitrification – seperate stage
24 – Biological nitrification – combined BOD and nitrification
25 – Biological denitrification
26 – Post aeration (reaeration)

Physical/Chemical Treatment
27 – Microstrainers – primary
28 – Microstrainers – secondary
29 – Sand filters
30 – Mix-media filters (sand and coal)
31 – Other filtrations
32 – Activated carbon – granular
33 – Activated carbon – powdered
34 – Two stage lime treatment of raw wastewater
35 – Two stage tertiary lime treatment
36 – Single stage lime treatment of raw wastewater
37 – Single stage tertiary lime treatment
38 – Recarbonation
39 – Neutralization
40 – Alum addition to primary
41 – Alum addition to secondary
42 – Alum addition to seperate stage tertiary
43 – Ferri-chloride addition to primary
44 – Ferri-chloride addition to secondary
45 – Ferri-chloride addition to seperate stage tertiary
46 – Other chemical additions
47 – Ion exchange
48 – Breakpoint chlorination
49 – Amonia stripping
50 – Dechlorination

Disinfection
51 – Chlorination for disinfection
52 – Ozonation for disinfection
53 – Other disinfection

Land Treatment
54 – Land treatment of primary effluent
55 – Land treatment of secondary effluent (30/30)
56 – Land treatment of intermediate effluent (less than secondary)

Other
57 – Stabilization ponds
58 – Aerated lagoons
59 – Outfall pumping
60 – Outfall diffuser
61 – Effluent to other plants
62 – Effluent outfall
63 – Other treatment
64 – Recalcination

SLUDGE PROCESSES

Treatment
65 – Aerobic digestion – air
66 – Aerobic digestion – oxygen
67 – Composting
68 – Anaerobic digestion
69 – Sludge lagoons
70 – Heat treatment
71 – Chlorine oxidation of sludge (Purifax)
72 – Lime stabilization
73 – Wet air oxidation
74 – Air drying
75 – Dewatering – mechanical – vacuum filter
76 – Dewatering – mechanical – centrifuge
77 – Dewatering – mechanical – filter press
78 – Dewatering – others
79 – Gravity thickening
80 – Air flotation thickening

Incineration
81 – Incineration – multiple hearth
82 – Incineration – fluidized beds
83 – Incineration – rotary kiln
84 – Incineration – others
85 – Pyrolysis
86 – Co-incineration with solid waste
87 – Co-pyrolysis with solid waste
88 – Co-incineration – others

Disposal
89 – Land fill
90 – Land spreading of liquid sludge
91 – Land spreading of thickened sludge
92 – Trenching
93 – Ocean dumping
94 – Other sludge handling
95 – Digest gas utilization facilities

MISCELLANEOUS
96 – Control/Lab./maintenance buildings
97 – Fully automated using digital control (computer)
98 – Fully automated using analog controls
99 – Semi automated plant
A1 – Manually operated and controlled plant
A2 – Package plant
A3 – Semi-package plant
A4 – Custom built plant

Item reference	Comments	Item reference	Comments

FORM EPA-1 (4-13-78)

17. **Summary of Category Needs:** This section is used to record the costs of Categories I-IVB. Column (A) is for the EPA assessment. Column (B) is for the State assessment, if different from (A). Column (C) is the portion required to satisfy Backlog Facility Requirements. Backlog refers to the facility requirements based on the 1980 population rather than the 2000 population. Column (D) is used to record the basis of estimation for the dollar amounts recorded in Column (A). Column (E) is used to record the reason the State submitted a separated State estimate in Column (B), if applicable. The codes for the basis of estimation used in Column (D) and (E) are defined on the reverse side of the form.

18. **Facility Population:** This section shows the population which receives treatment and/or collection by the facility. Collection and treatment populations are further categorized as follows: present residents, present nonresidents, projected nonresidents, projected residents, and projected nonresidents.

19. **Need For New Collectors, Interceptors, Force Mains, and Pumping Stations:** This section lists codes for new collectors, interceptors, outfalls, force mains, and pumping stations and their costs. The diameter of the pipe is in inches. The capacity of pumping stations is the average daily capacity in million gallons per day (mgd).

20. **Disposal of Liquid Effluents:** A one digit code is entered in each of the three Columns-(A), (B), (C)-to describe the method(s) of effluent disposal used by the facility. The code in Column (A) describes the method. The code in Column (B) describes the operational status. The code in Column (C) describes the expected physical change. All codes are defined on the reverse side of the form.

21. **Required Infiltration/Inflow (I/I) Corrective Action:** A one digit code indicating the required action to eliminate excessive I/I, if applicable.

22. **Estimated I/I Flow:** The quantity of I/I flow (mgd) to be eliminated by the corrective action indicated in item 21.

23. **Major Rehabilitation/Replacement Required:** A one digit code for the type of corrective action required to accomplish major rehabilitation or replacement of a portion of a sewerage system, if applicable.

24. **Do Wastewaters Originate in Communities Existing Before October 18, 1972?:** This item is self-explanatory and is answered yes or no.

25. **1972 Collection Population:** The resident population in existence in which still requires new collector sewers.

26. **Effluent Characteristics:** A one digit code indicating the present and future effluent a facility is designed to produce.

27. **Reasons:** A one digit code indicating the reason for any facility being designed to achieve a greater than secondary level of treatment.

28. **Supplemental Sheets:** A one digit code indicating the use of an additional data collection sheet to list specialized information about the facility.

29. **Flows, Concentrations, Monthly Average:** This section is for compiling information on the present performance and design values for treatment facilities. This section lists the monthly averages for various parameters according to the existing actual performance, the present design, and the projected design. Data are compiled for the following parameters (if applicable): Total flow (mgd); total industrial flow (mgd); domestic flow per capita (gallons per day); and influent and effluent concentrations of five day biochemical oxygen demand (BOD), suspended solids (SS), phosphorus, and ammonia.

30. **Other:** A three digit code is used in this item to indicate the presence of known toxics in the influent to a treatment facility. The codes for toxics are listed in the technical guidance document.

31. **Receives Discharge From:** If the facility receives flow from another facility, the authority/facility number of the other facilit is entered in item 31-A.

31B. **Discharge To:** If the facility discharges flow to another facility, the authority/facility number of the other facility is entered in item 31-B.

32. **Treatment and Sludge Handling:** This section is used to compile information about the unit processes at the facility. An appropriate code is entered in each of the three columns-(A), (B), (C)-to describe a particular unit process. The code in Column (A) describes the process. The code in Column (B) describes the operational status of the process. The code in Column (C) describes the expected physical change to the process. All codes are listed on the reverse side of the form.

Appendix D

Description of The Combined Sewer System Worksheet

The combined sewer system worksheet is supplemental to the EPA-1 form described in Appendix C, for those facilities known to be served by combined sewers. Since combined sewers provide both urban drainage and wastewater conveyance, they may not always be defined on an individual facility-by-facility basis. For the purposes of the Needs Survey, a separate worksheet was completed for each combined sewer system/major receiving water configuration. Thus, a single worksheet may consider more than one combined sewer network (i.e., facility) if the networks are adjacent and discharge to the same major receiving water. A single worksheet may also consider a number of facilities which are included in a single comprehensive CSO planning document.

The definition of a major receiving water is somewhat subjective. However, an attempt was made to define a receiving water as objectively as possible. In general, an urban receiving stream was considered to be a major receiving water if it was known to be a continuously flowing water body which could become fishable and swimmable after providing adequate control of CSO and/or other pollution sources. Streams which were wholly within a combined sewer watershed were not considered major receiving waters. On the other hand, streams draining a significant watershed area upstream from the combined sewer area were considered major receiving waters.

The 1980 combined sewer system worksheet is illustrated on Figure D-1. Listed below is a brief explanation of each item on that worksheet.

Section 1—Identification and Combined Sewer System Data

Section 1 of the worksheet provides identification and descriptive data on the combined sewer system.

1. **Authority/Facility Number**—The authority/facility number is defined in the Guidance for Categories I-IV. The number reported in this item is for the major facility serving the combined sewer system. If more than one facility was involved, the additional A/F numbers are found under Item No. 15.

2. **Authority Name**—The authority name is the official name of the authority with major responsibility for operation of the combined sewer system.

3. **State, Country, Place**—The state, county, place code is defined in the Guidance for Categories I-IV. This code applies to the facility reported in Item No. 1.

4. **SMSA Number**—Those combined sewer systems located at least in part within a standard metropolitan statisical area (SMSA) as defined in the U.S. Census Bureau are reported by SMSA number in this item.

5. **Basin**—The basin code is defined in the Guidance for Categories I-IV. This code applies to the location of the combined sewer system.

6. **Congressional District**—The number of the congressional district(s) (three maximum) which are served by the combined sewer system.

7. **City Name**—The city name is the official name of the city or town served by the combined sewer system.

8. **County Name**—The county name is the official name of the county or county equivalent in which the major portion of the combined sewer system is located.

9. **Drainage Area**—The area, in acres, drained directly by the combined sewer system which is tributary to the subject receiving water.

10. **Separate Sewer Area**—This is the area, in acres, served by separate sanitary sewers which discharge directly into the combined sewer system. Codes for Item No. 10 are as follows:

0 - No information presently available.

1 - Some separate sanitary sewers are connected; however, the area is unknown.

2 - Area is known and is reported.

A code of 2 and a reported area of 0.0 means that no separate sanitary sewers discharge directly into the combined sewer system.

11. **Population Served**—The total number of resident to the area drained directly by the combined sewer system defined in Items No. 9 and 10.

12. **Sewer Length**—The total length of combined sewer, in feet, tributary to the subject receiving water.

13. **Number of CSO Points**—This is the number of points at which the combined wastewater/stormwater is discharged from the collection system directly into the receiving water during periods of high flow.

14. **Population Equivalent**—This is the dry-weather flow population equivalent for the combined sewer area defined on a BOD basis and includes the resident population (Item 11), commercial contribution, existing industrial contribution, and transient population.

15. **Additional Authority/Facility Number(s)**—Since combined sewer systems may be defined using hydrologic or previous planning considerations, data for several treatment facilities may be reported on one worksheet. This item reports all authority/facility numbers which are associated with the major facility serving a combined sewer system.

16. **Local Contact**—This item identifies the name, title, address, and phone number of the public works official responsible for operation of the combined sewer facility.

Section 2—Receiving Water Characteristics

A single worksheet was completed for each combined sewer system/major receiving water combination. A major receiving water has been defined previously. Descriptions of each item in Section 2 follow:

17. **Name of Receiving Water**—The common name of the major receiving water is identified by this item.

18/19. **Mean Annual Flow and 7/Q/10**—The average flow rate and 7-day, 10-year low flow rate of the major receiving water are reported in cubic feet per second (cfs) by these two items. In general, this information was obtained from U.S. Geologica Survey records nearest the upstream boundary of the combined sewer area. Codes for Items 18 and 19 are given as follows:

0 - Flow rate not applicable, e.g., lake.

1 - Flow rate measured at USGS gauge.

2 - Flow rate estimated from regional relationship.

20. **Receiving Water Classification** The purpose of the receiving water classification is to describe the general characteristics of the receiving water. A verbal description is used to place the receiving water in one of 15 separate categories. Values and ranges of depth and.or velocity are given on the following code reference chart. Depths and velocities are mean values and apply to mean flow conditions.

Receiving water classification codes:

1 - Creeks and shallow streams [depth (d) <2 feet].

2 - Upstream feeders ($2<d<5$).

3 - Intermediate channels ($5<d<10$)

4 - Main drainage rivers ($10<d<20$)

5 - Large rivers ($20<d<30$)

6 - Impounded rivers (flow controlled or depth >30 feet).

7 - Small ponds, backwaters.

8 - Lakes.

9 - Shallow high tidal velocity estuary or bay (depth <10 feet $V \geqslant 1.5$ fps).

10 - Shallow low tidal velocity estuary orbay (depth <10 feet <1.5 fps).

11 - Medium depth, high tidal velocity estuary or bay (depth 10 to 30 feet, $V \geqslant 1.5$ fps).

12 - Medium depth, low tidal velocity estuary or bay (depth = 10 to 30 feet, $V < 1.5$ fps).

13 - Deep, high tidal veolcity estuary or bay (depth >30 feet V 1.5 fps).

14 - Deep, low tidal velocity estuary or bay (depth >30 feet V 1.5 fps).

15 - Open ocean or beach.

21. **Known Rearation Coefficient**-If a reaeration rate for the subject receiving water has been measured, value and the flow rate rate which the measurement was made are recorded. Units of the reaeration rate are per day base e.

22. **Channel Slope**—This is the approximate receiving stream slope, reported in feet per mile, and in general was estimated from USGS topographic maps. This item applies only to free-flowing streams (receiving water classification 1 through 5 and is not reported if Item 21 is completed.

23. **Receiving Water Background Quality**—These background quality data correspond to upstream flow of the major receiving water prior to impact from the combined sewer system. USGS Water Quality records may have been a source for this information. Data on the following parameters are recorded:

Maximum mean monthly temperature in °C (generally occurs in July or August)

Average BOD_5 concentration in mg/1

Average SS concentration in mg/1

Average fecal coliform concentration in MPN/100 ml

24. **USGS Gauge Number**—If receiving water flow estimates reported in items No. 18 and 19 were derived directly from USGS flow records, the station identification number is recorded here.

25. **Type of Aquatic Life**—The type of aquatic life which could reasonably be supported under unpolluted or contaminated conditions in the receiving water downstream from the combined sewer system is recorded using codes defined as follows:

1 - Cold freshwater fishery, e.g., trout

2 - Cold freshwater nursery or breeding area

3 - Warm freshwater fishery, e.g., black bass

4 - Warm freshwater nursery or breeding area

5 - Estuary nonshellfish waters

6 - Estuary shellfish waters

7 - Open ocean

26. **Known CSO Problems**—Water quality problems associated with the the receiving water downstream from the combined sewer area which are known to be caused at least in part by combined sewer overflow are recorded using the following codes:

0 - No known problems

1 - Asthetic degradation

2 - High suspended solids levels

3 - Low dissolved oxygen levels

4 - Bacteriological contamination

5 - Sludge deposits

6 - Toxic conditions

7 - Fishkills

8 - Eutrophication (nutrients)

9 - Other, see comments

Up to four known CSO problems can be recorded in decreasing order of severity.

Section 3—Status of CSO Abatement Projects

A major emphasis of the 1980 Needs Survey was to identify those municipalities which had conducted CSO planning. If CSO planning was completed, the objective was to determine compliance with EPA Program Requirements Memoranda PRM 75-34 and PRM 77-4.

27. **Overall Status**—The overall status of CSO abatement projects for the combined sewer system described on a given worksheet was designated using the following codes:

1 - Planning not yet begun

2 - Ongoing 208

3 - Draft 208

4 - Completed 208

5 - Ongoing 201 (step 1)

6 - Draft 201

7 - Completed 201

8 - Ongoing CSO planning, non-EPA-funded

9 - Draft CSO planning, non-EPA-funded

10 - Completed CSO planning, non-EPA funded

11 - Ongoing design (Step 2)

12 - Completed design

13 - Construction in progress

14 - Construction complete

More than one code may apply to any given facility. For example, a facility may have been included in a completed 208 (Code 4) and is currently being studied by an ongoing 201 (Code 5).

28. **Completion Dates**—For each of the codes entered above, the actual or expected cmpletion dates were recorded in a table, as follows:

	Completion Date	
Code	Month	Year

In the case where CSO planning has not yet begun (Code 1, Item No. 27), the date reported was the anticipated starting date of CSO planning.

29. **Planning and PRM 75-34**—To determine if current CSO facility planning was complete, comprehensive, and consistent with the requirements of PRM 75-34 the following points were considered when a Code 3, 4, 6, or 7 was entered under Item No. 27. If the

Figure D-1

```
  DATA FILLED IN BY:*                  ******************************************************                   COMMENTS ON BACK:
                    *                  *COMBINED SEWER SYSTEM DATA FILE - 1980 NEEDS SURVEY*                    ****** *****
  DATE:             *                  ******************************************************                    *YES * *NO *
  *******************                                                                                            ****** *****

  I. IDENTIFICATION AND COMBINED SEWER SYSTEM DATA                II. RECEIVING WATER (RW) CHARACTERISTICS
--------------------------------------------------                ----------------------------------------

 1.AUTHORITY/FACILITY NO.:                                         17.RW NAME:
 2.AUTHORITY NAME:                                                 18.MEAN ANNUAL FLOW CODE:   FLOW:           CFS
 3.STATE/CO./PLACE:     /  /                                       19.LOW FLOW:        CODE:   FLOW:           CFS
 4.SMSA NO.:                                                       20.RW CLASSIFICATION:
 5.BASIN:                                                          21.KNOWN REAREATION RATE:
 6.CONG.DIST:                                                        1/DAY(BASE E) FLOW:         CFS
 7.CITY:                                                           22.CHANNEL SLOPE:        FT/MI
 8.COUNTY:                                                         23.RW QUALITY
 9.COMBINED SEWER AREA:              ACRES                           MAX.MONTHLY TEMP:              (DEG) C
10.SEPARATE SANITARY CODE:      AREA:            ACRES                AVE.BOD5:                     MG/L
11.POPULATION:                                                        AVE.SS:                       MG/L
12.COMBINED SEWER LENGTH:               FT                            AVE.FECAL COLIFORM:           MPN/100ML
13.NUMBER CSO POINTS:                                              24.USGS GAGE NO.:
14.POPULATION EQUIVALENT:                                          25.AQUATIC LIFE:
15.OTHER A/F NO.(S):                                               26.KNOWN CSO PROBLEMS:

16.LOCAL CONTACT:   NAME:
                    TITLE:
                    STREET:
                    CITY:
                    PHONE:

III. STATUS OF CSO ABATEMENT PROJECTS
-------------------------------------
27.OVERALL STATUS:

28. COMPLETION DATES  **29.PLANNING AND PRM 75-34 REVIEW**        30.    MULTI-PURPOSE         ** 31. PROPOSED SOLUTIONS
    CODE    MO.  YR.  **      A.  B.  C.  D.  E.  F.  G. **            A.      B.       C.     **           CODE(S)
                      **                                 **                                    **
                      **                                 **                                    **
                      **                                 **                                    **
                      **                                 **                                    **
                      **                                 **                                    **


IV. GRANT INFORMATION
---------------------
32.GRANT NUMBER(S):

V. GRANT ELIGIBLE COST ESTIMATES (IN THOUSANDS OF DOLLARS)
-----------------------------------------------------------
33.COST ESTIMATES

CODE     COST  MO. YR.**   CODE       COST   MO.  YR.   ** CODE               COST  MO. YR. ** CODE                 COST  MO. YR.
                      **                                **                                  ** 23.FISH&WILD:
                      **                                **                                  ** 24.RECREATION:
                      **                                **                                  ** 25.SEWER SEP.:
                      **                                **                                  ** 26.NEEDS MET:
                      **                                ** 22.AESTHETICS:                   **    TO CONGRESS:
```

following items were considered, a Code 1 (yes) was entered for each point. If it was not considered, a Code 2 (no) was entered.

a. Receiving water quality objectives were defined.

b. Residual water quality problems were identified (i.e., the existence of a receiving water quality problem after achievement of the secondary treatment requirement was established).[1]

c. Pollutant removal requirements were estimated.

d. Alternate CSO control techniques were identified.[1]

e. A cost-effective mix of CSO alternative was considered.

f. A cost-effective mix of CSO, AST, AWT, and/or other control measures was considered.[1]

g. Marginal costs were determined not to be substantially greater than marginal benefits for the proposed solution.[1]

30. **Multipurpose Projects**—The objective of Item No. 30 was to determine if a CSO project has purposes other than pollution control (e.g., flood control or drainage). The results of Item No. 30 were reported for the following three points by using a Code 1 if the point was affirmative (yes) and a Code 2 if the point was negative (no).

a. Does the CSO abatement project have purposes other than pollution control (e.g., flood control or drainage)?

b. Was the cost allocated to CSO pollution control determined by the alternative justifiable expenditure (AJE) method?

c. Is the cost allocated to CSO pollution control less than or equal to the least cost single purpose CSO pollution control alternative?

31. **Proposed Solutions**—If Codes 3, 5, 6, or 7 were entered under Item No. 27 and if the resulting draft or completed documents were available for review, the proposed solutions for control of CSO (five maximum) were reported using the following codes:

1. Sewer separation.

2. In-system storage with additional treatment capacity.

3. In system storage with real-time control and additional treatment capacity.

4. Earthen basin storage with additional treatment capacity.

5. Concrete (uncovered) basin storage with additional treatment capacity.

6. Concrete (covered) basin storage with additional treatment capacity.

7. Mined storage (e.g., deep tunnels) with or without additional treatment capacity.

8. High-rate treatment without storage (e.g., swirl concentrator, screening, etc.).

9. In-system storage without additional treatment capacity.

10. In-system storage with real-time control and without additional treatment capacity.

11. Surface-water interception/storage/diversion scheme (i.e., runoff diverted before entering a combined sewer system).

12. Sewer flushing.

13. Catch basin cleaning.

14. Streetsweeping.

15. Other, see comments.

20. Cost-effective mix of CSO alternative.

21. Cost-effective mix of CSO, AST, AWT, and/or other control measures.

Section 4—Grant Information

32. **Grant Numbers**—Grant numbers, if any, which provide Federal construction grant funds for CSO control (i.e., Category V) were entered here.

Section 5—Grant-Eligible Cost Estimates

Grant-Eligible Cost Estimates

33. **Cost Estimates**—For each of the proposed CSO solutions identified in Item No. 31, a cost estimate was entered, when available, along with the month and year used to establish the value of money when the estimate was made.

The following codes were used for reporting cost estimates of proposed solutions:

1. Sewer separation.

2. In-system storage with additional treatment capacity.

3. In-system storage with real-time control and additional treatment capacity.

4. Earthen basin storage with additional treatment capacity.

5. Concrete (uncovered) basin storage with additional treatment capacity.

6. Concrete (covered) basin storage with additional treatment capacity.

7. Mined storage (e.g., deep tunnels) with or without additional treatment capacity.

8. High-rate treatment without storage (e.g., swirl concentrator, screening, etc.).

9. In- system storage without additionl treatment capacity.

10. In-system storage with real-time control and without additional treatment capacity.

11. Surface-water interception/storage/diversion scheme (i.e., runoff diverted before entering a combined sewer system).

12. Sewer flushing.

13. Catch basin cleaning.

14. Streetsweeping.

15. Other, see comments.

19. State-supplied (separate) estimate.

20. Cost-effective mix of CSO alternatives.

21. Cost-effective mix of CSO, AST, AWT, and/or other control measures.

22. Aesthetics objective, estimated using the 1980 Needs Estimation Program (NEP80) described in Appendix II.

23. Fish and wildlife objective, estimated using NEP80 described in Appendix II.

24. Recreation objective, estimated using NEP80 described in Appendix II.

25. Sewer separation, estimated using NEP80 in Appendix II.

26. Needs previously met.

Needs reported to Congress.

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[1] Criteria which are specifically required by PRM 75-34.